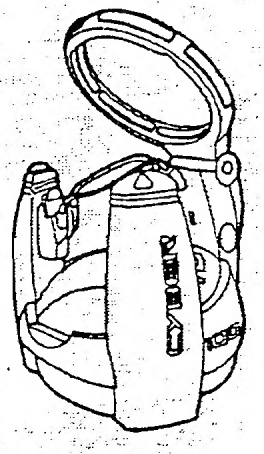
Cyber Space 1000

CS 1000



VIRTUALITY®

SERVICE MANUAL AND FAULT FINDING GUIDE

VIRTUALITY ENTERTAINMENT LTD
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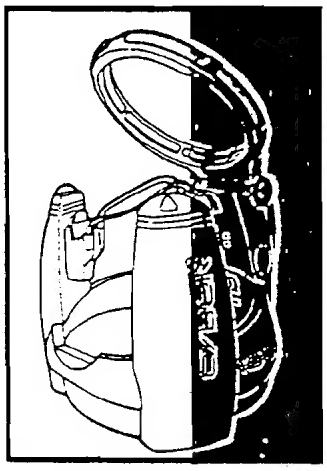
CyberSpace1000

CS1000

MANUAL AND FAULT–FINDING GUIDE



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VIRTUALITY®

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CS 1000 MANUAL AND FAULT-FINDING GUIDE

The aim of this manual is to ensure that you get the best reliability and performance from your CS1000. Should a problem occur, this manual will, assist you to diagnose and rectify the fault as soon as possible with the minimum of down time.

Although every unit manufactured by Vituality Entertainment Ltd is of the highest quality and undergoes a pre-delivery inspection, and is pre-tested for a minimum of 48 hours. faults can still occur whilst machines are in transit or operated for great lengths of time without any preventative maintenance carried out by qualified personnel.

This is your master copy which will need occasional updating. Amendments will be provided by V.E.L. These are accompanied by instructions, and you will be required to fill in the amendment sheet on the following page.

Whilst every care is taken to ensure that information in this manual is correct, no liability can be accepted by the author or publisher for loss, damage or injury caused by any errors in, or omissions from, the information given.

AMENDMENTS

No.	DATE	INITIALS	No.	DATE	INITIALS

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INSPECTION & SERVICE

Hourly Inspections.

Hourly inspections should be carried out by the operator on the Visette Pads and Lenses. Lenses should be wiped clean with a soft dry lens cloth if required. Visette Pads should be cleaned using moist medicated wipes ensuring you cover all areas in contact with the head and face. **Do not use the moist wipes on the lenses.**

Daily Inspections

Daily inspections should be carried out every day prior to any public use by the trained operator to ensure complete safety of all users and equipment. A detailed daily inspection list has been provide in this manual and may be freely copied to be used by all operators. Any fault or damage should be reported immediately to enable repairs or adjustments to be made prior to public use.

Weekly Maintenance

Check all visette® cable entry plates, ensuring screws are tight and where necessary, replaced. Ensure fan filters are checked and cleaned with a vacuum cleaner as required.

Monthly clean

1. Eject the CD caddy once a month and remove from drive – this action cleans the laserhead lens.
2. At the same time, clean the disc and the CD caddy with a soft dry cloth.
3. Re-insert caddy.

Regular Thorough Examinations

Thorough examinations should be carried out every 4 months to ensure the reliability of equipment and safety of users. The person appointed to carry out the thorough inspection should be independent of the owner, controller and operator of the device.
The appointed competent person should have such qualifications, knowledge, experience and supporting resources to enable them to make an assessment of the safety of the device including any associated equipment.

Service and repairs

Service and repairs should only be carried out by an authorised service agent. Any warranty and maintenance agreement will be void if any other party conducts repairs, service or modifications to the equipment or software without prior authority from the supplier or manufacturer.

Daily Inspection List

1. The console should be carefully inspected for cracks or other damage.

2. The exterior surface should be cleaned and where necessary wiped with a damp cloth or a solution of mild detergent on a sponge or cloth. We recommend car bodywork ammonia type cleaning fluids. The surfaces should be wiped dry with a soft dry cloth prior to any public use. Chemical cleaning agents should not be used without prior advice from the manufacturer. Do not allow liquid to enter into any part of the equipment structure.

3. Check all external cables and connectors for damage and ensure they are secured and do not cause a tripping hazard.

4. Check all cables to the Backpack, Visette and Joystick for any sign of damage. These cables have an armour sheath to protect the communication wires within and it is important that there are no breaks in this protective layer, and they are free from all kinks. Check the backpack retractor cable is intact and the tension of the spring is set correctly.

5. Check that all access and floor panels are correctly secured and keys removed.

6. Ensure that the disclaimer restriction sign is displayed in a prominent position and legible.

7. Check the casing and foam pads on the Visette and Joystick for any damage. Dirty, torn or damaged pads should be replaced to ensure maximum comfort and safety of all users.

8. Check that the Ergolok™ and Headband adjustment on the Visette are functioning correctly with no free play in the clutch.

9. Check the operation of the Joystick buttons.

10. Check the external speakers and set the appropriate level to suit the environmental conditions.

11. Check the Visette® internal headphone level and set to the appropriate comfort level.

12. Check the Visette® internal screens are operational. Ensure the alignment is set correctly and the brightness is equally balanced. (If any misalignment is observed, ensure a qualified engineer is allowed to re-align the system.) A procedure for re-aligning the Visette® internal screens is described in the Visette® chapter.

13. Check correct operation of the Visette® and Joystick tracker system.

14. Ensure that the access and surounding areas of the console are free of obstructions likely to cause a tripping hazard.

DIMENSIONS AND SPECIFICATIONS

WIDTH:	1420mm
DEPTH:	1450mm
HEIGHT:	1400mm
VOLTAGE:	220/110 Volts
POWER CONSUMPTION:	250 Watts
WEIGHT:	120 Kg (Approx)

WARNING: THESE UNITS MUST BE EARTHED

RESTRICTIONS ON SITING YOUR CS1000

The two main restrictions when siting your CS1000 fitted with the 'FASTRAK' system are:

1. Physically

The units should be positioned a minimum of 1.5M from other units, walls or large obstructions. Ceiling heights should be a minimum of 2.6M.

2. Electronically

As the units use an electromagnetic tracking system, large metallic objects, TVs or monitors and large power sources may cause interference. Ceilings should not be of metallic construction and in the case of false ceilings, ensure there is no metallic trunking above the ceiling panels. TVs, monitors, or large power sources should be positioned 3 metres from the unit.

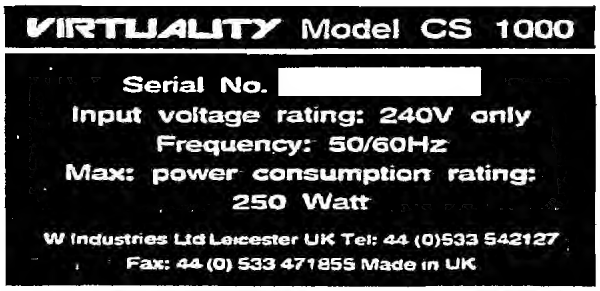
Note:

Machines fitted with the tracker system (Manufactured before September 1992. Serial N°s 1001-1087) Should be positioned a minimum of 3 metres apart or a 'swimming' effect may be experienced. Otherwise the restrictions stated above apply.

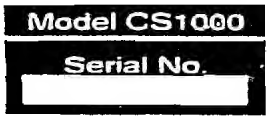
SERIAL NUMBERS AND IDENTIFICATION PANELS

When communicating with Virtuality Customer Service Department please be sure to quote the machine serial number and where applicable, sub-assembly serial numbers.

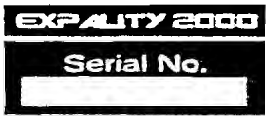
The main console identification plate can be found on the rear connection plate – low down on the C.S. rear panel.



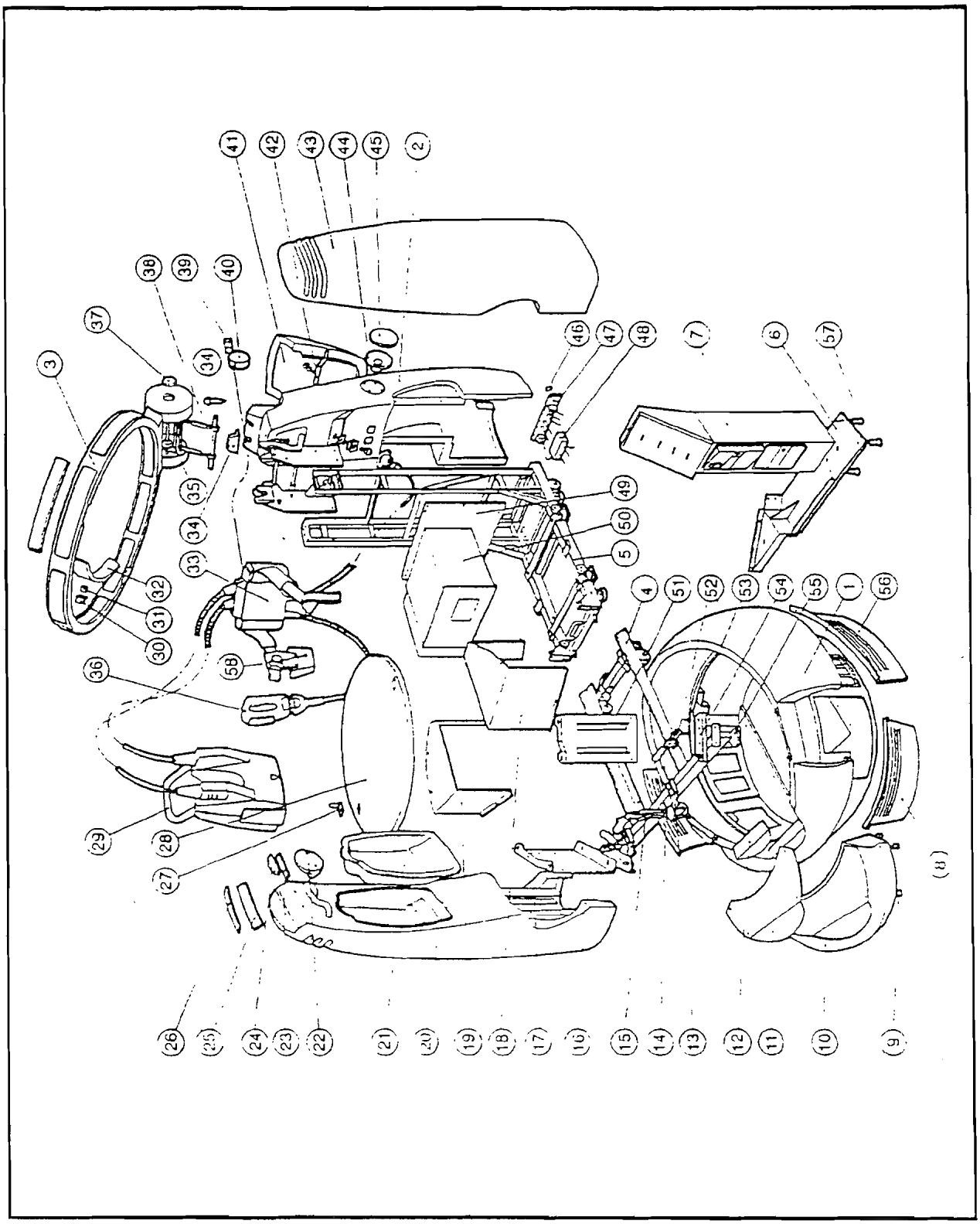
Each sub-assembly which makes up the main console can be identified with a smaller identification plate.



The Expality3 unity can be identified by it's own plate – situated on the front panel.



1000 CS
Parts List



1000 CS
Parts List

Item	Description	Part No.
1	GRP BASE	218-096
2	CS REAR PILLAR	218-038
3	GRP RING	218-095
4	CS BASE FRAME SUB	CS BASE FRAME SUB
5	CS TROLLEY ASSY	CS TROLLEY ASSY
6	CS COIN COLUMN MOUNT	218-123
7	CS COIN COLUMN	218-122
8	LOUVRE TRIM PNL	218-039
9	RUBBER FAST FEET	213-507
10	GRP STEP	218-042
11	STEP, CHECKER PLATE	218-081
12	STAINLESS STEP	218-078
13	FRAME FASTENERS A11070120	MIS 00007
14	R/H LOUVRE TRIM PANEL	218-097/R
15	BRAUER CLAMP	218-511
16	R/H PILLAR BRACKET	218-118R
17	MTG BKT CLAMP FLT W239	218-056
18	L/HS COWL ISSUE B	218-120
19	R/HS COWL ISSUE B	218-119
20	RING SUPPORT R/H	218-046
21	CS VISETTE LINER	218-103
22	CS COLUMN RING BUFFER	218-019
23	COLUMN PAD D	218-090
24	COLUMN PAD A	218-087
25	COLUMN PAD C	218-089
26	COLUMN PAD B	218-088
27	RING HANDLE P1716/D	MIS 00134
28	FLOOR CHECKER PLATE	218-076
29	CS VISETTE	CS VISETTE
30	TRANSMITTER BRACKET	218-149
31	FASTRAK TRANSMITTER	218-525T
32	BUMPER PAD	210-028 (COLOUR)
33	CS BACKPACK	CS BACKPACK
34	BACKPACK HANGER	218-162
34	BACKPACK HOOK (alternative to hanger)	221- 022
35	PIVOT PIN SPACER	218-045
36	CS SPACE JOYSTICK 2	CS SPACE JOY 2
37	RING END COVER	218-069
38	CS GAS STRUT ASSY	CS GAS STRUT ASSY
39	RETRACTOR PLATE	218-137
40	RETRACTOR	218-510
41	GRP REAR DOOR	218-062
42	REAR DOOR LOCK BAR	218-100
43	RING SUPPORT L/H	218-040
44	SPEAKER TS E1777	214-038
45	SPEAKER GRILL	
46	DOME PLUG 2703	MIS 00256
47	REAR CONNECTOR PLATE	218-008
48	CONNECTOR UNIT 480-305	MIS OO123

1000 CS
Parts List

Item	Description	Part No.
49	REAR PILLAR PANEL	218-070
50	CS EXPALITY 240V/110V	CS EXPALITY
51	L/H PILLAR BRACKET	218-118L
52	COLUMN CLAMP P2502B	MIS 00010
53	PILLAR LOCATION PEG	218-053
54	PILLAR BASE	218-052
55	FRAME BASE FEET	MIS 00004
56	L/H LOUVRE TRIM PANEL	218-097L
57	COIN COLUMN FEET	211-509
58	SPACEJOY II HOLSTER	229-012

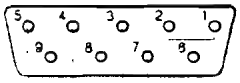
RGB MONITOR OUTPUT

TYPE :	RGB Analogue
VOLTAGE :	1v Pk to Pk
IMPEDENCE :	75 ohms
CONNECTOR :	9 Pin D-Type Female
SYNC TYPE :	Combined Sync (+ve)
SYNC VOLTAGE :	0.3 volts
LINE PERIOD :	64 µs (15625 Hz)
FIELD RATE :	49.92 Hz

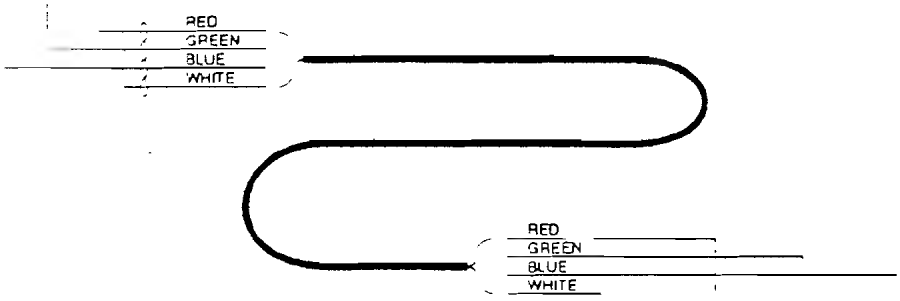
PIN	SIGNAL
1	Ground
2	Screen
3	Red
4	Green
5	Blue
7	Sync

STANDARD WIRING FOR SCART CABLE

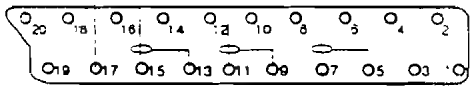
REAR VIEW OF
9 PIN D-TYPE PLUG



NOTE: If the horizontal control coils have not been reversed, the image on the screen will be mirrored.



On some makes of monitors, pins 20 and 16 may need to be linked together.



REAR VIEW OF SCART PLUG

RECOMMENDED SERVICE TOOL KIT

1. Mains Soldering Iron
2. Desolder Pump
3. Solder
4. Soldering Aids
5. Glass Fibre Pencil
6. Pointed Tweezers
7. Needle Files
8. 6" Adjustable Spanner
9. Metric Allen Key Set
10. 6" Steel Rule
11. Neon Mains Test Screwdriver
12. Cutter - Diagonal
13. Snipe Nose Pliers
14. Combination Pliers
15. Wire Stripper
16. Trimming Tools
17. Jewellers Screwdriver - Cross Point
18. Jewellers Screwdriver - Flat Blade
19. Pozidrive Screwdriver - No 0
20. Pozidrive Screwdriver - No 1
21. Pozidrive Screwdriver - No 2
22. Flat Blade Screwdriver Set
23. Nut Runner Set - Metric
24. 0 - 8 BA Spanner Set
25. 4 - 11mm Spanner Set
26. Anti-static Strap & Wrist Band
27. Scissors
28. QM 24 Pin Extraction Pin
29. Thread Studlock

RECOMMENDED SPECIALIST TOOLS

30. Ball Ended Allen Driver - 2.0mm
31. Ball Ended Allen Driver - 2.5mm
32. Ball Ended Allen Driver - 3.0mm
33. Ball Ended Allen Driver - 4.0mm
34. Ball Ended Allen Driver - 5.0mm
35. Large Pipe Wrench
36. Small Pipe Wrench
37. Digital Multimeter
38. Black Insulating Tape
39. Miniature Torch
40. K – K Crimp Tool
41. 50 Ohm Coax. Crimp Tool
42. Right Angled Flat Screwdriver
43. Right Angled Cross Screwdriver
44. Precision Wire Stripper
45. Pin Extraction Tool
46. Miniature Hand Drill
47. Graphics Card Test Lead
48. Amiga 23w to 9w Test Lead
49. 9-Way D-Type Plug and Socket
50. 15-Way D-Type Plug and Socket
51. 25-Way D-Type Plug and Socket

ED - File Editor

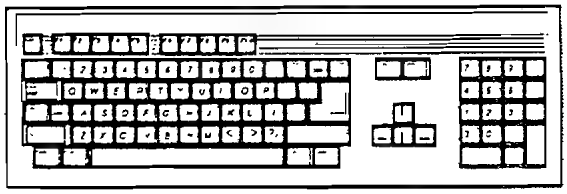
General Description

ED is a file editor that comes as part of the Expality® computer operating system. It is relatively simple to use. Below is a description of a small subset of commands which are available with ED. There are other commands available, but they do not need to be listed here. If the commands listed below are not typed correctly, they may cause unwanted changes to the file with undesirable results. Therefore, it is important to take care when typing in these commands.

Getting Started

NOTE: < > is used to denote typed commands.
To begin to edit a file, simply type:

ed <filename> <CR>



EXPALITY® KEYBOARD

where <filename> is the name of the file you wish to edit (without the angled brackets) and <CR> is the RETURN key.

Commands

There are two kinds of commands in ED – namely immediate mode commands and extended mode commands. The editor defaults to immediate mode on start-up and you simply type in the commands as shown below. To utilise extended mode commands, you must first press the ESCAPE key, followed by the command, and then press the RETURN key. (The ESCAPE key will be referred to as <Esc> throughout this document and the RETURN key as <CR>). As an example, to use the extended mode command to exit ED and save the changes made to the file, you would type:

<Esc>x<CR>

This will be denoted here simply as:

x

to avoid confusion.

When in extended mode, an asterix (*) will appear below the last line of the displayed file. Simply typing <CR> will return you to the immediate mode.

Extended mode commands

q quit with out saving text.

x quit and update - saving changes to file.

Immediate mode commands

<CNTRL> b delete line

<arrow keys> move cursor up, down, left, right.

Keyboard Controls – Dactyl Nightmare

Note : These functions are case sensitive.
These keys operate during game play or demo mode

KEY	FUNCTION
q	Quit game
c	Credit machine
p	Pause on/off
A	Display Amiga screen
G	Display graphics screen
i	"Captain Scarlet" mode (invincible)
I	Turn off above
d	Call bird to attack man
9	Add 60 seconds to game time
0	Remove 60 seconds from game time
h	Set player height (automatically)

Keyboard Controls – Dactyl Nightmare

KEY	FUNCTIONS
'Cursor keys'	Adjust player head angle.
F1	Credit Machine No. 1
F2	Credit Machine No. 2
F3	Credit Machine No. 3
F4	Credit Machine No. 4
F5	Toggle old/new body models
F6	Reset game
F7	Select "Capture the Flag" game
F8	Select normal "Shootout" game
F10	Start game
SHIFT (	Decrease Mic volume
SHIFT)	Increase Mic volume
SHIFT _	Decrease CD volume
SHIFT +	Increase CD volume
-	Decrease sound effects volume
=	Increase sound effects volume

Note :

To save volume levels, quit from the game using 'q'. Pressing "A" before adjusting the volumes will allow you to see what is happening. All the levels are between 0 and 63. The factory settings:- MIC–63; CD–48; FX–52.

Keyboard Controls – Dactyl Nightmare

COMMAND LINE SYMBOL	DESCRIPTION
e	Enable platform edge detection (without this, it is possible to fall off platforms)
n	Enable new bodies (actual faces on the characters instead of a Visette).
v	Visor mode. Do not remove this option, it reverses left and right.
h	Automatic height adjustment. Keeps characters height constant irrespective of player height.
b<n>	Bird attacks after <n>shots, the default value is 10.
t<n>	Game time set to <n>seconds. Default value is 180.
c	Select Camera Exploity view. (Not available without extra hardware).
u	Select "U-key" credit device (extra hardware required).
g	Enable Spanish sound effects(!!)
s	Select external, overhead transmitter. DO NOT USE.

C.S. 1000 ASSEMBLY PROCEDURE

When the C.S. 1000 arrives and has been unpacked from its crate. Carefully assemble the unit using the following procedure :

1. Remove the fan box on the side of the expality (page 2.3 - items 14, 15) and lift off the case.

2. Check the expansion cards are seated correctly and have not come loose in transit. Now refer to the C.S. parts list Page 1.5

3. Place the expality (item 50) onto the trolley (5).

4. Connect all of the cables from the wiring looms onto the rear connection ports as labelled.

5. Insert the keyboard connection on the front of computer.

6. Re-assemble fan box and filter and lock computer onto trolley using the bottom centre bolts on each side.

7. Carefully slide trolley assy (5) into base frame (4) and secure using the frame fasteners (13).

8. Locate the R/H ring support (20) onto the base (1) ensuring all 4 lugs locate correctly. Secure using orange handled column clamp (52)

9. Repeat paragraph 8 with L/H ring support (43).

10. With two people - locate the ring (3) onto the rear pillar (2).

WARNING . Take care not to damage or trap the transmitter plug and cable in any of the pivot link mechanism.

11. Temporarily position the bottom bar of the gas strut assy (38) in front of the two black locating hooks.

Note : The lower gas strut bar is not engaged at this point in assembly.

12. Snap the pivot pin (35) into place.

Note : The pivot pin locking mechanism is spring loaded and can be locked into position when correctly positioned by turning the two silver knobs a quarter of a turn and released.

C.S. 1000 ASSEMBLY PROCEDURE

13. Lift the ring (3) past it's limit until the lower bar on the gas strut assy (38) locates into place on each side of the black hooks.

14. Now locate the two silver hooks onto the horizontal bar - these lock into place the lower bar of the gas strut assy.

15. Connect the transmitter 7 pin din plug into its socket (the socket is mounted horizontally along a bar inside the rear door access cover (41).

16. Locate and position the floor plate (28). Two people are required for this.

17. If the cable is too long from the backpack (33) to the rear pillar (2), release the gland on the rear pillar and feed the cable through, until it is the correct length. Re-tighten gland (on later models gland is covered by an anti-tamper fitting).

18. Connect the retractor ring (40) onto the backpack (33).

19. Position the C.S. unit. Then lower the feet (55) by releasing the brauer clamp (15) and raise the blue wheel.

Note : Do not lift the unit by the bottom skirt when raising and lowering the blue wheel.

20. Connect all cables to the rear of the unit and switch on.

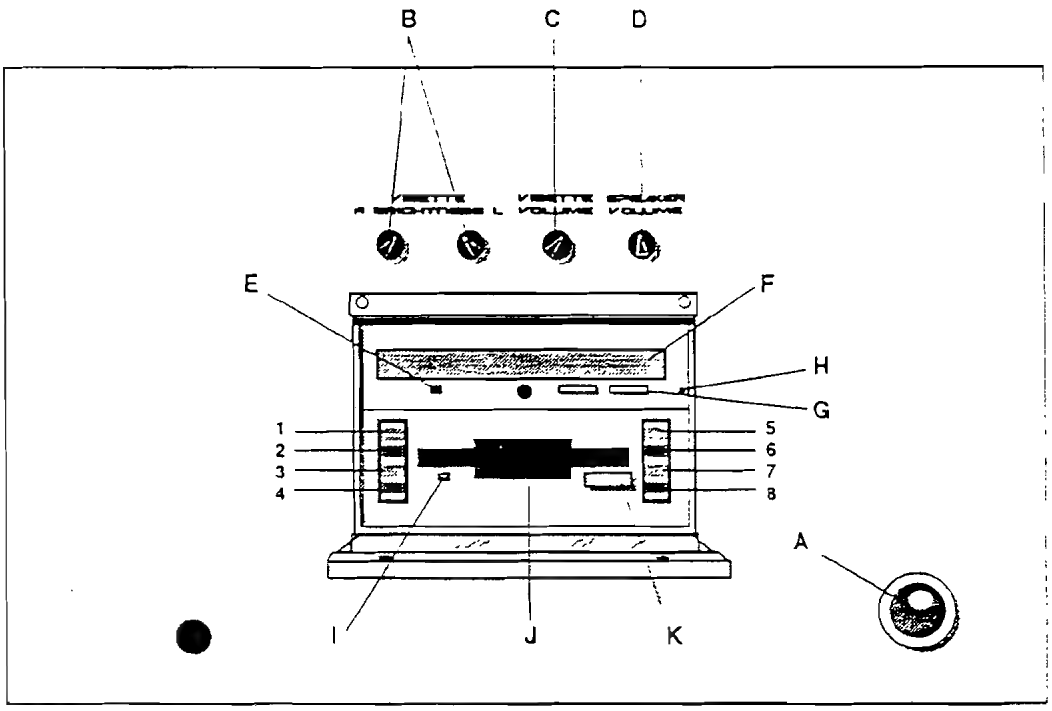
21. Leave the machine running for approximately 5 minutes and check to make sure the screens are of equal brightness.

22. Carry out full daily inspection. Check as detailed on Page 1.2.

PAGE

2.1 Front Panel
2.2 Rear Panel
2.3 Expality® Case Parts List
2.4 Exploded View
2.5 Parts List
2.6 Exploded View
2.7 Parts List
2.8 Format Board Component Layout
2.9 A3000 Component Layout
2.10 Mono Output (single graphics card)
2.11 Adjusting Software Volume Settings
2.12 External Monitor Signal
2.13 Power-up Troubleshooting Flowchart

CS EXPALITY® UNIT – Front Panel



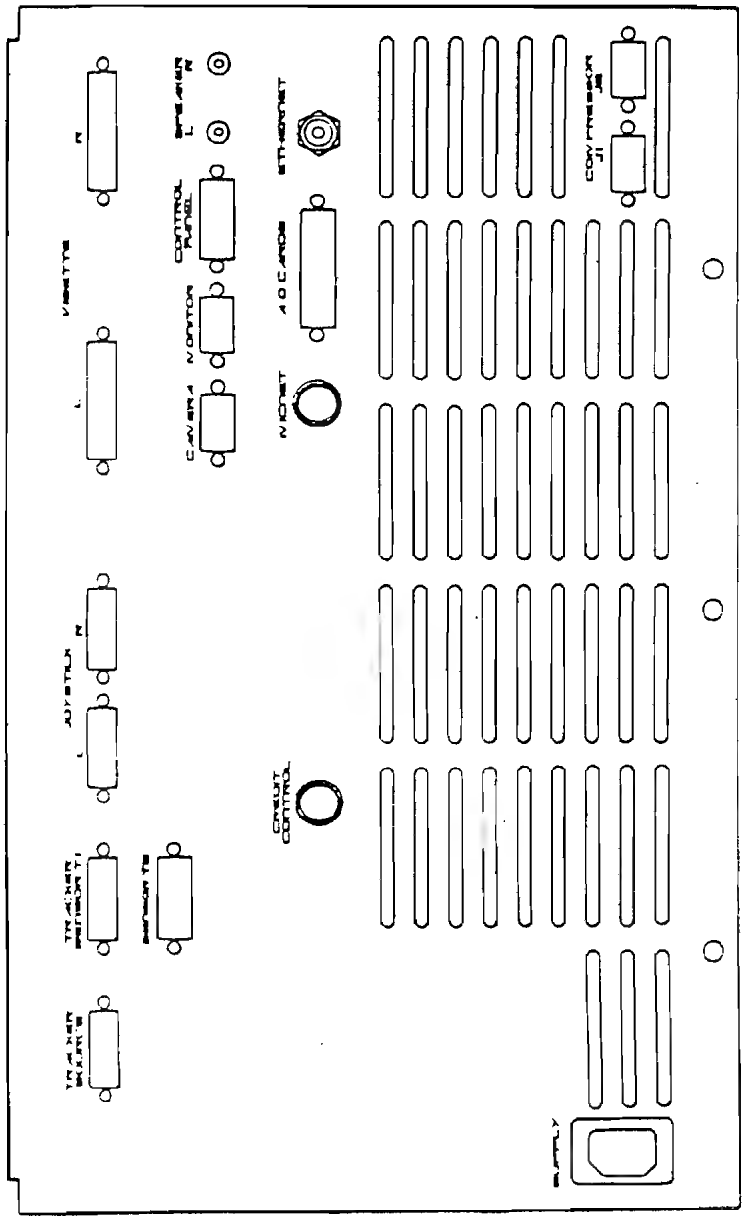
EXPALITY® Controls

A. POWER ON/OFF SWITCH
B. VISETTE® BRIGHTNESS - LEFT HAND AND RIGHT HAND
C. VISETTE® VOLUME
D. SPEAKER VOLUME
E. POWER/LOADING/UNLOADING/BUSY INDICATOR
F. CADDY DOOR
G. CD ROM EJECT BUTTON
H. MANUAL EMERGENCY EJECT HOLE
I. FLOPPY DISK ACTIVITY LIGHT
J FLOPPY DISK ACCESS SLOT
K. FLOPPY DISK EJECT BUTTON

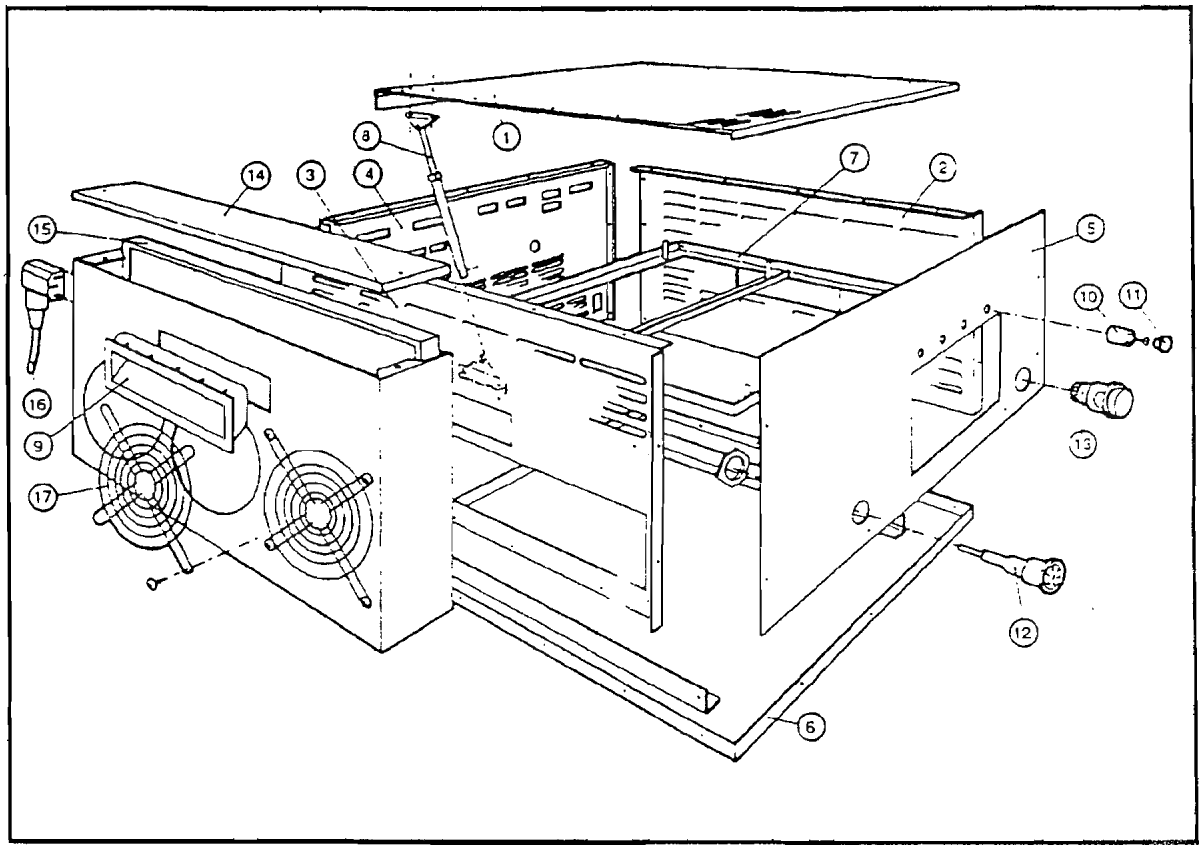
L.E.D.S

1. +25V EXTERNAL AUDIO POWER INDICATOR
2. -25V EXTERNAL AUDIO POWER INDICATOR
3. +15V FORMAT BOARD POWER INDICATOR
4. -15V FORMAT BOARD POWER INDICATOR
5. +9V L.C.D. SUPPLY TO VISETTE®
6. +5V T.T.L. SUPPLY INDICATOR
7. -5V AMIGA POWER INDICATOR
8. S.C.S.I. HARD DISK ACCESS INDICATOR

EXPALITY REAR PANEL

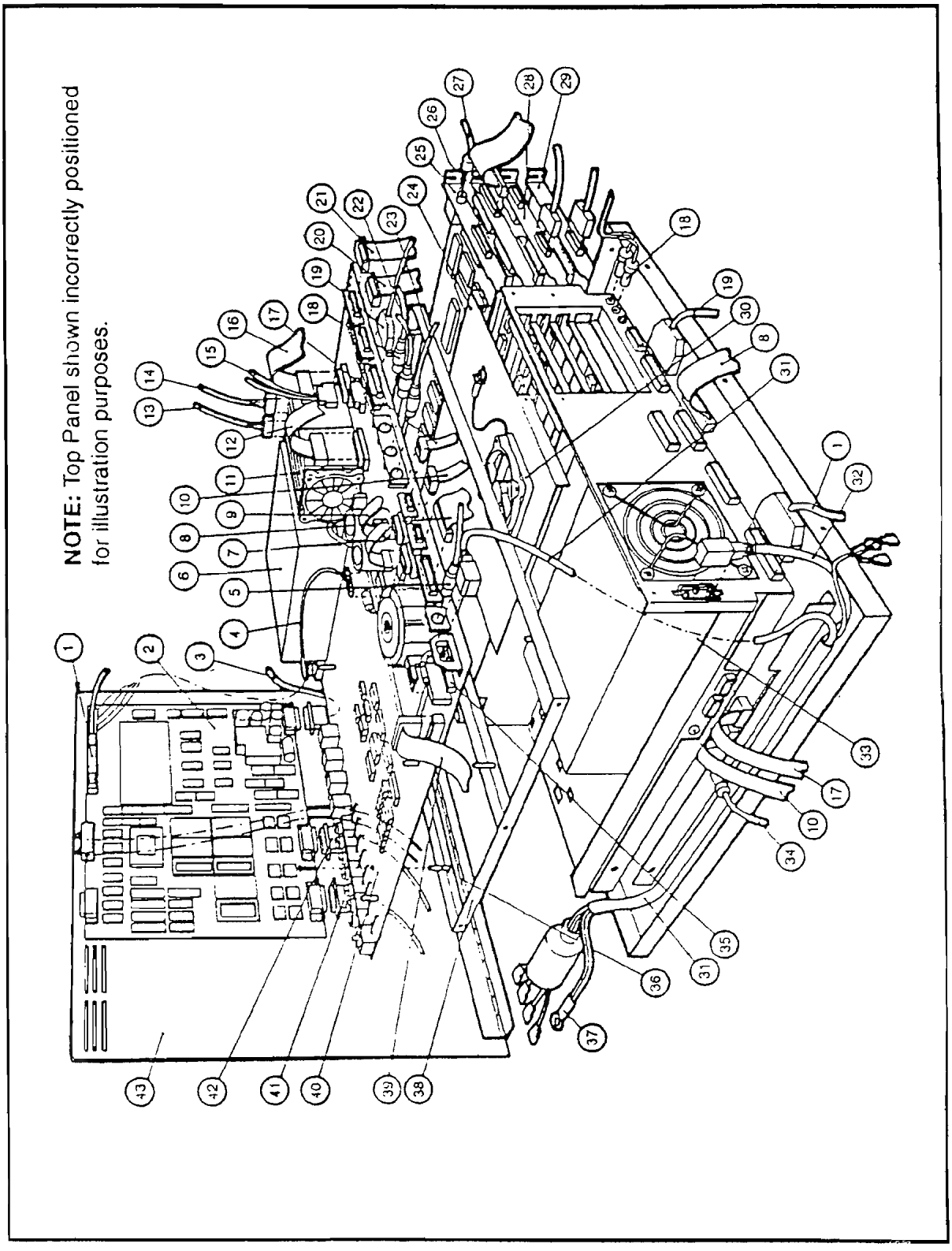


CS EXPALITY®
Parts List



Item	Description	Qty	Code
1	Top Panel Type 'D'	1	213-074
2	R/H Side Panel Type 'C'	1	213-072
3	L/H Side Panel	1	213-009
4	Rear Panel Type 'D'	1	213-073
5	Front Panel Type 'B'	1	213-041
6	Base Plate	1	213-007
7	Format BD Chassis	1	213-013
8	Flap Support	1	213-539
9	Handle P2-52	2	213-520
10	Knob 498-693	4	213-536
11	Knob Position Indicator	4	213-536
12	Keyboard Extension Cable	1	213-016
13	Red Switch	1	SWT 00002
14	Fan Housing Cover	1	218-074
15	Filter Frame	1	218-075
16	IEC Power Skt	1	MIS 00033
17	Finger Guard	3	MIS 00016

CS EXPALITY® CORE
Parts List

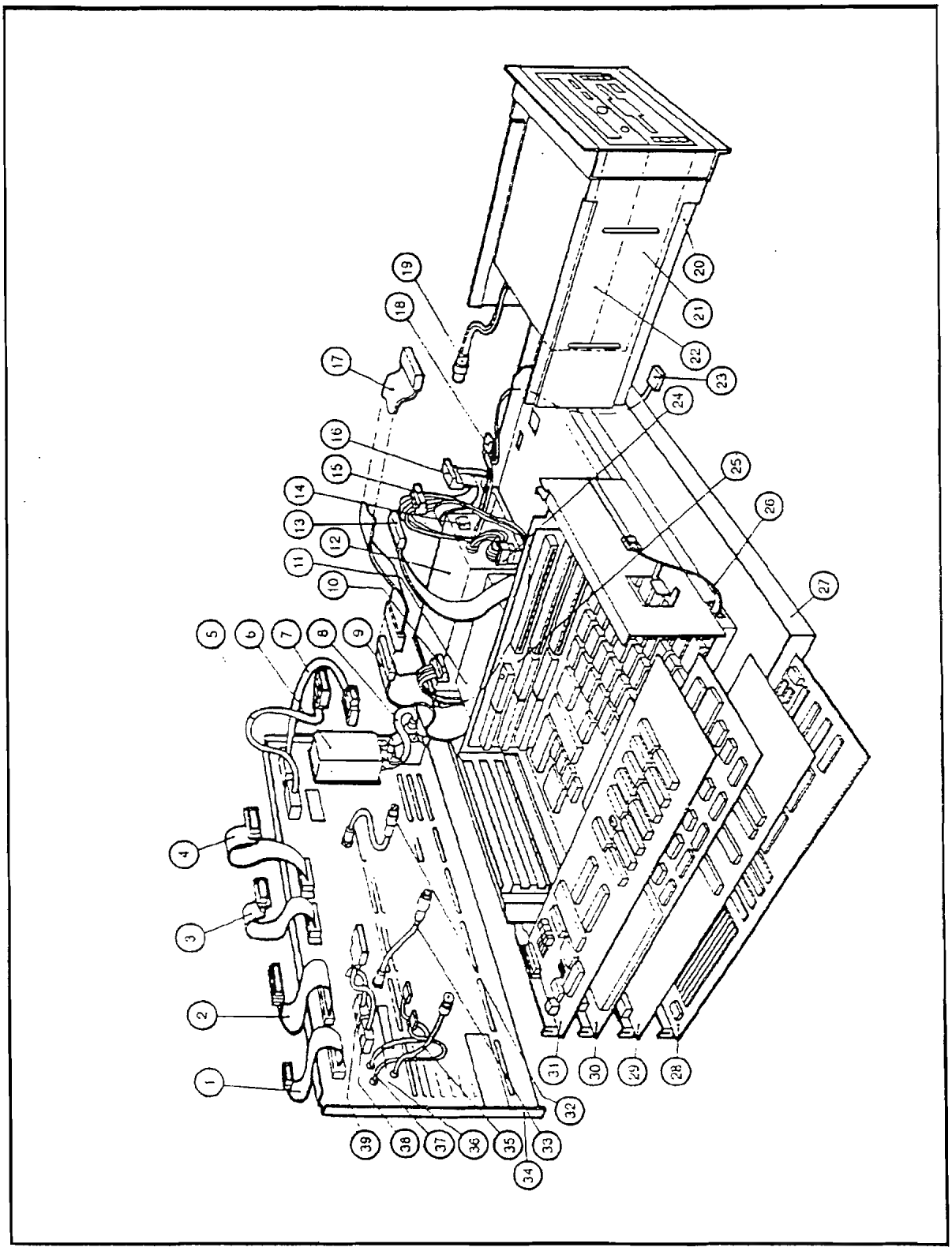


CS EXPALITY® CORE
Parts List

ITEM	DESCRIPTION	PART No.
1	C.S. Serial Lead	213 - 082
2+	Fastrak Board	218 - 525/SB
3	Source Jumper Cable	
4	Fastrak Power Lead	
5	Coin - op Jumper Cable	213 - 053
6	Format Board P.S.U.	211 - 652
7	Joystick Jumper Cable L/H	213 - 055
8	Parallel Cable	213 - 033
9	Joystick Jumper Cable R/H	213 - 055
10	Joystick 1 Cable L/H	213 - 025
11	Ext Audio Power Amps	MIS 00171
12	Visette Jumper Cable L/H	213 - 019
13	Ext Audio Jumper Cable L/H	
14	Ext Audio Jumper Cable R/H	
15	Mon/Lamp Jumper Cable	213 - 068
16	Visette Jumper Cable R/H	213 - 019
17	Joystick 0 Cable R/H	213 - 024
18	Amiga Audio Lead	213 - 023
19	Amiga Video Lead	213 - 018
20	Slave Graphics Cable	213 - 022
21	Master Graphics Cable	213 - 021
22	C.D. Rom Lead	213 - 015
23	Micnet Jumper Cable	213 - 052
24	R.F. Shield	213 - 048
25*	Network Card	213 - 526
26*	Slave Graphics Card	213 - 517
27	Ethernet Jumper Cable	213 - 031
28*	Master Graphics Card	213 - 517
29*	Dual Serial Card	213 - 428
30	Fan 12v	213 - 538
31	Mains Power Lead	213 - 069
32	Amiga P.S.U. Power Lead	213 - 069
33	Amiga P.S.U.	211 - 651
34	Keyboard Ext Cable	213 - 016
35	Format Board Mains Fuse	
36	Pillar	MIS 00040
37	Earth Tag	
38	Format Support Chassis	213 - 013
39	LED Cable	213 - 029
40	Format Board	213 - 005/EP or P
41	T1 Sensor Jumper Cable	213 - 081
42	T2 Sensor Jumper Cable	213 - 081
43	Top Panel	213 - 074

* Note Expansion Cards not necessanly in this configuration.

+ On C.S. 1001 to 1087 item 2 is 'Tracker Board' Part Number 213 - 523/P C.B. with Top Panel Hinge on Expality Side Panel.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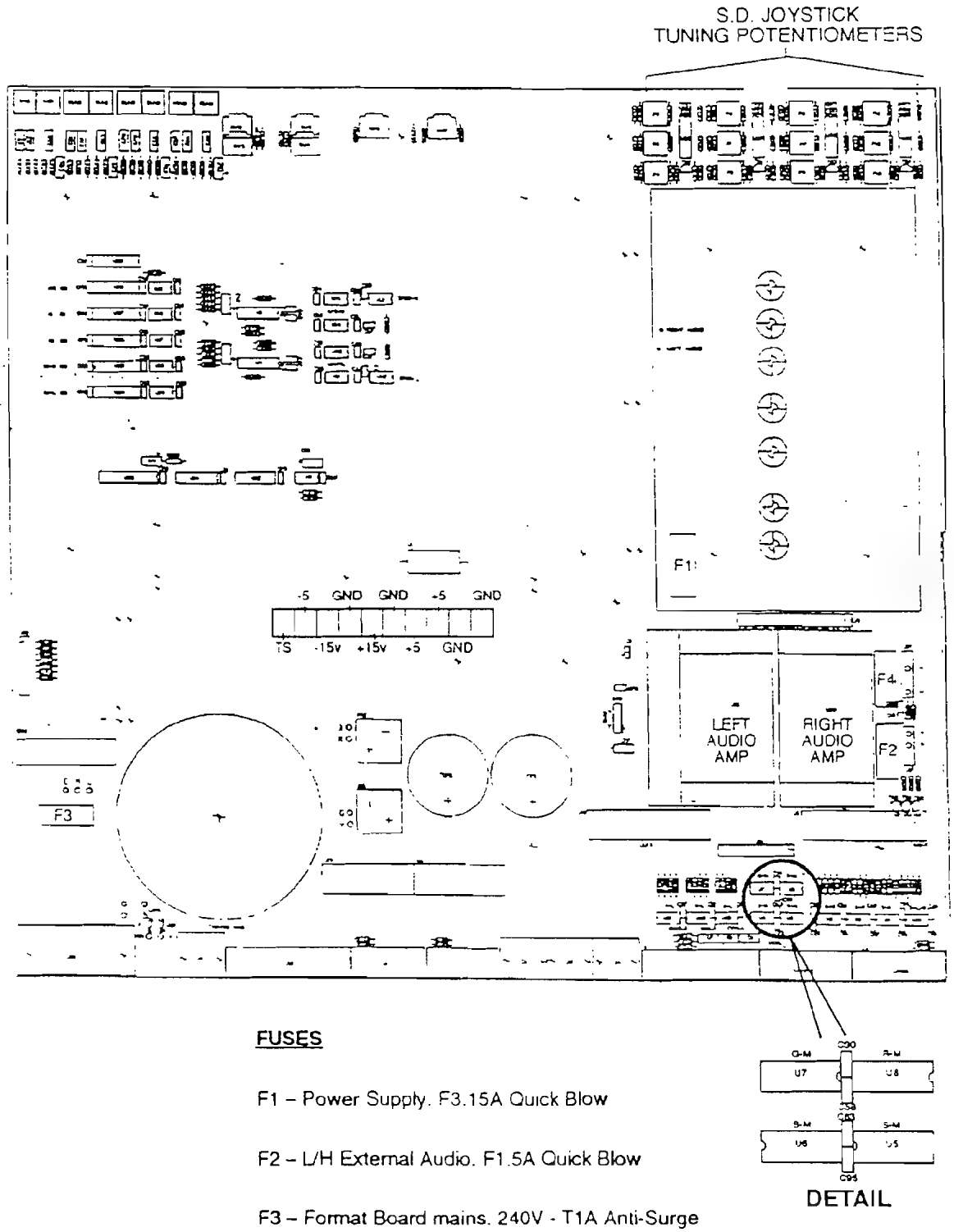
CS EXPALITY®
Parts List

ITEM	DESCRIPTION	PART No.
1	Visette® Jumper Cable R/H	213-019
2	Visette® Jumper Cable L/H	213-019
3	Joystick Jumper Cable R/H	213-055
4	Joystick Jumper Cable L/H	213-055
5	Sensor Jumper Cable	217-018
6	Mains Filter	218-501
7	Source Jumper Cable	
8	Mains Jumper Cable	213-088
9	Amiga S.C.S.I. Cable	
10	Hard Disk Power Connector	
11	Hard Disk	MIS 00247
12	Amiga Power Supply Unit	211-651
13	Floppy Drive Serial Connector	
14	Switch – Amiga P.S.U.	
15	CD ROM Power Connector	
16	LED Cable	213-029
17	S.C.S.I. – CD Jumper Cable	213-044
18	Power Connector – not used	
19	CD ROM Lead	213-015
20	Disk Drive Module	213-509
21	Floppy Disk drive	MIS 00209
22	CD ROM	213-516
23	Floppy Drive Power Connector	
24	P.S.U. Connector to Motherboard	
25	Daughterboard	
26	LED Cable	213-029
27	Amiga Bottom Case	
28	Dual Serial Card*	213-528
29	Master Graphics Card*	213-517
30	Slave Graphics Card*	213-517
31	Network Card*	213-526
32	Coin-Op Jumper Cable	213-053
33	Micnet Jumper Cable	213-052
34	Rear Panel D	213-073
35	Ethernet Jumper Cable	213-031
36	L/H Speaker Jumper Cable	
37	R/H Speaker Jumper Cable	
38	Lamps Connector	213-068
39	Monitor Connector	213-068

* Not necessarily in this configuration.

Format Board Component Layout



FUSES

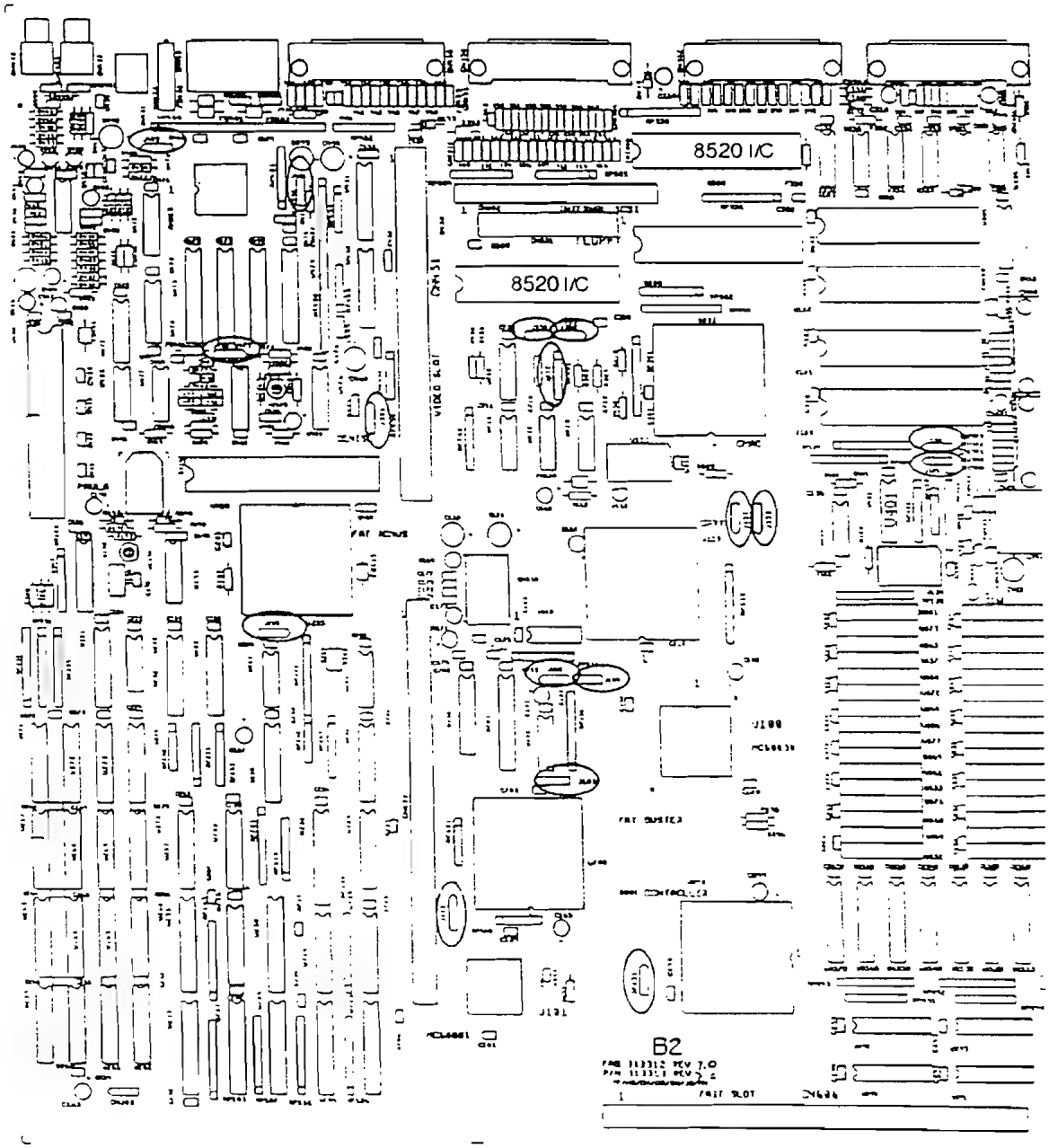
F1 – Power Supply. F3.15A Quick Blow

F2 – L/H External Audio. F1.5A Quick Blow

F3 – Format Board mains. 240V - T1A Anti-Surge
110V - T3.15 Anti-Surge

F4 – R/H External Audio F1.5A Quick Blow

A3000 PCB Board Layout



TO CONVERT A STEREO IMAGE OUTPUT ON THE EXPALITY® TO MONO IMAGE OUTPUT

1) SWITCH OFF ALL POWER TO THE EXPALITY®
2) Open the top of the Expality®
3) Locate the two 15-way ribbon cables (plugged in to sockets marked CARD1 and CARD2) at the rear left of the format board. CARD1 is connected to the MASTER (lower) graphics card; CARD2 is connected to the SLAVE (upper) graphics card.
4) Remove the 15-way ribbon cable joining the socket marked CARD2 to the SLAVE (upper) graphics card.
5) Open the left side panel of the Expality®, by removing the fan panel.
6) Carefully remove the crystal oscillator link wire joining the two graphics cards.
7) Remove the SLAVE (upper) graphics card by unscrewing the retaining screw (near to the rear of the Expality®) and carefully pulling the card out.
8) Carefully remove the 8MHz crystal oscillator from its socket on the graphics card and insert it into the Right hand socket on the MASTER graphics card, left empty by removal of the crystal oscillator link wire.
9) Replace the side and top panels on the Expality®.

TO SWITCH GRAPHICS CARDS AND RETAIN MONO IMAGE OUTPUT ON THE EXPALITY®

1) SWITCH OFF ALL POWER TO THE EXPALITY®
2) Open the top of the Expality®
3) Remove the 15-way ribbon cable joining the socket marked CARD1 to the single graphics card.
4) Open the left side panel of the Expality, by removing the fan panel.
5) Remove the single graphics card by unscrewing the retaining screw (near to the rear of the Expality®) and carefully pulling the card out.
6) Remove the crystal oscillator from this graphics card and insert it into the right hand socket on the replacement graphics card.
7) Carefully replace the replacement graphics card into the Expality® ensuring correct seating of the card by firmly inserting it into its slot. Use the retaining screw to hold the graphics card in place.
8) Connect the same 15-way ribbon cable from the socket marked CARD1 to the graphics card, making sure it is also connected to the format board.
9) Replace the side and top panels on the Expality®.

WARNING

Anti-static precautions **MUST** be taken at **all** times when handling graphics cards.

TO ALTER CD SOUND EFFECTS AND MICROPHONE VOLUMES VIA SOFTWARE

1. Ensure the experience is running (ie with animated graphics being displayed on the front monitor).

2. Type SHIFT 'A' (ie the uppercase letter 'A', without quotes, by holding the shift key down while typing the letter 'A'). This will display text (in reverse) on the front monitor.

3. The following keys will affect the different volume levels as such :-

Shift '9' : Microphone volume down 1
Shift '0' : Microphone volume up 1
'-' : Sound effects volume down 1
'=' : Sound effects volume up 1
Shift '-' : CD volume down 1
Shift '=' : CD volume up 1

All volumes are in the range 0 - 63 where 0 is equivalent to 'OFF'. During alteration of levels, the current level of the volume that is being changed is displayed on the next to last line of the text screen, in reverse.

4. After the volume levels have been adjusted, type 'Q' to terminate the experience and save the new volume levels.

5. Re-boot the Expality to make use of the new volume levels.

EXTERNAL MONITOR SIGNAL

The external monitor signal is amplified using maxim 453 video amplifiers. These can be damaged if :

1) More than 1 monitor is connected to the system without using a video distribution box - part No VID 00001.

2) The leads are connected and disconnected whilst the unit is powered-up.

3) The cables have been damaged, shorting the signals to ground.

The video amplifier I/C's can be located on Page 2.8

U5 = SYNC
U6 = BLUE
U7 = GREEN
U8 = RED

GRAPHICS CARD PALETTE I/C PART No = MIS 00381

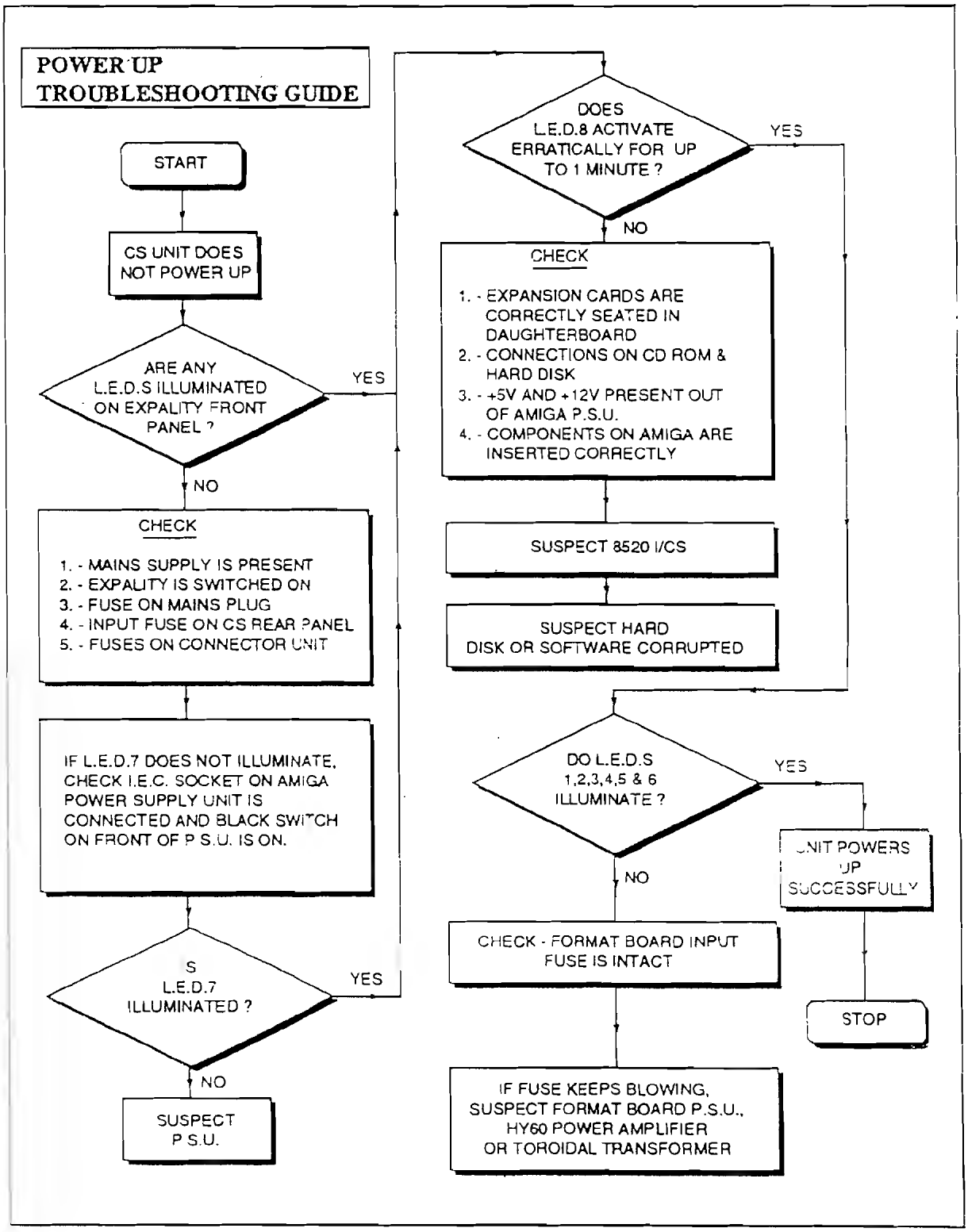
The colour quality generated from the graphics card can be damaged if :

1) More than 1 monitor is connected directly to the card without using a video distribution box.

2) Anti-static precautions have not been taken whilst handling graphics cards.

FAULT SYMPTOM

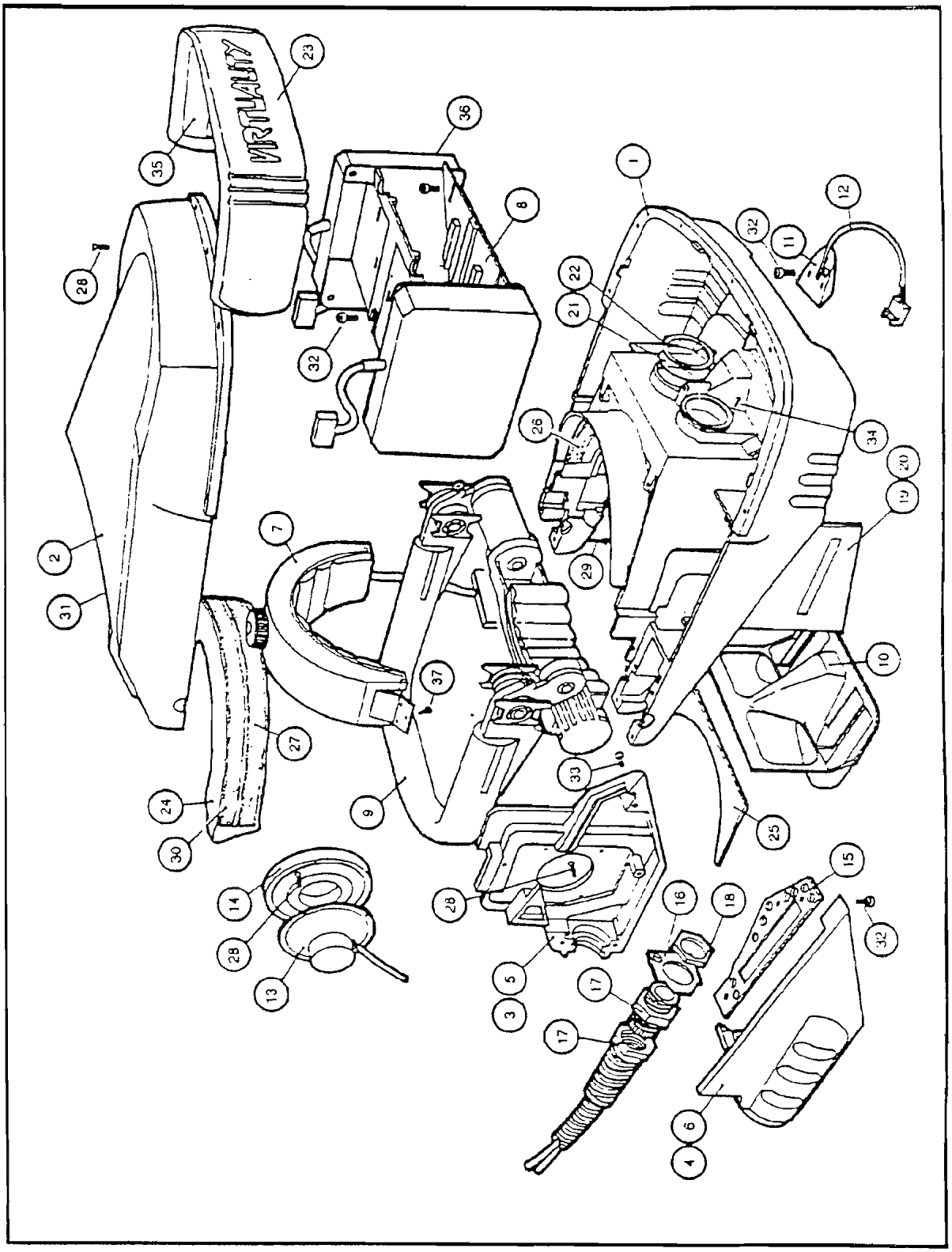
The symptom will appear as a degraded quality of colour in the visette or front monitor. Use the E.T.S. System to check each colour grade. Select F6 Visette Stereo Alignment and change the image to R.G.B. test signal.


POWER UP
TROUBLESHOOTING GUIDE
START
CS UNIT DOES NOT POWER UP
ARE ANY L.E.D.S ILLUMINATED ON EXPALITY FRONT PANEL ?
YES
NO
CHECK
1. - MAINS SUPPLY IS PRESENT
2. - EXPALITY IS SWITCHED ON
3. - FUSE ON MAINS PLUG
4. - INPUT FUSE ON CS REAR PANEL
5. - FUSES ON CONNECTOR UNIT
IF L.E.D.7 DOES NOT ILLUMINATE, CHECK I.E.C. SOCKET ON AMIGA POWER SUPPLY UNIT IS CONNECTED AND BLACK SWITCH ON FRONT OF P S.U. IS ON.
S L.E.D.7 ILLUMINATED ?
YES
NO
SUSPECT P S.U.
DOES L.E.D.8 ACTIVATE ERRATICALLY FOR UP TO 1 MINUTE ?
YES
NO
CHECK
1. - EXPANSION CARDS ARE CORRECTLY SEATED IN DAUGHTERBOARD
2. - CONNECTIONS ON CD ROM & HARD DISK
3. - +5V AND +12V PRESENT OUT OF AMIGA P.S.U.
4. - COMPONENTS ON AMIGA ARE INSERTED CORRECTLY
SUSPECT 8520 I/CS
SUSPECT HARD DISK OR SOFTWARE CORRUPTED
DO L.E.D.S 1,2,3,4,5 & 6 ILLUMINATE ?
YES
NO
UNIT POWERS UP SUCCESSFULLY
STOP
CHECK - FORMAT BOARD INPUT FUSE IS INTACT
IF FUSE KEEPS BLOWING, SUSPECT FORMAT BOARD P.S.U., HY60 POWER AMPLIFIER OR TOROIDAL TRANSFORMER

PAGE

3.1 Visette® Exploded View
3.2 Visette® Parts List
3.3 Backpack and Loom Exploded View
3.4 Backpack and Loom Parts List
3.5 Headband Assembly Parts List
3.6 Ergolok Module Parts List
3.8 Epson Monitor Box Parts List
3.9 Panasonic Monitor Box Parts List
3.10 Monitor Re-alignment Procedure
3.12 Ergolok Clutch and Headband Adjustments
3.13 Disconnecting/Reconnecting a Visette®
3.14 Visette® Monitor Troubleshooting Flowchart

CS VISETTE®
Parts List



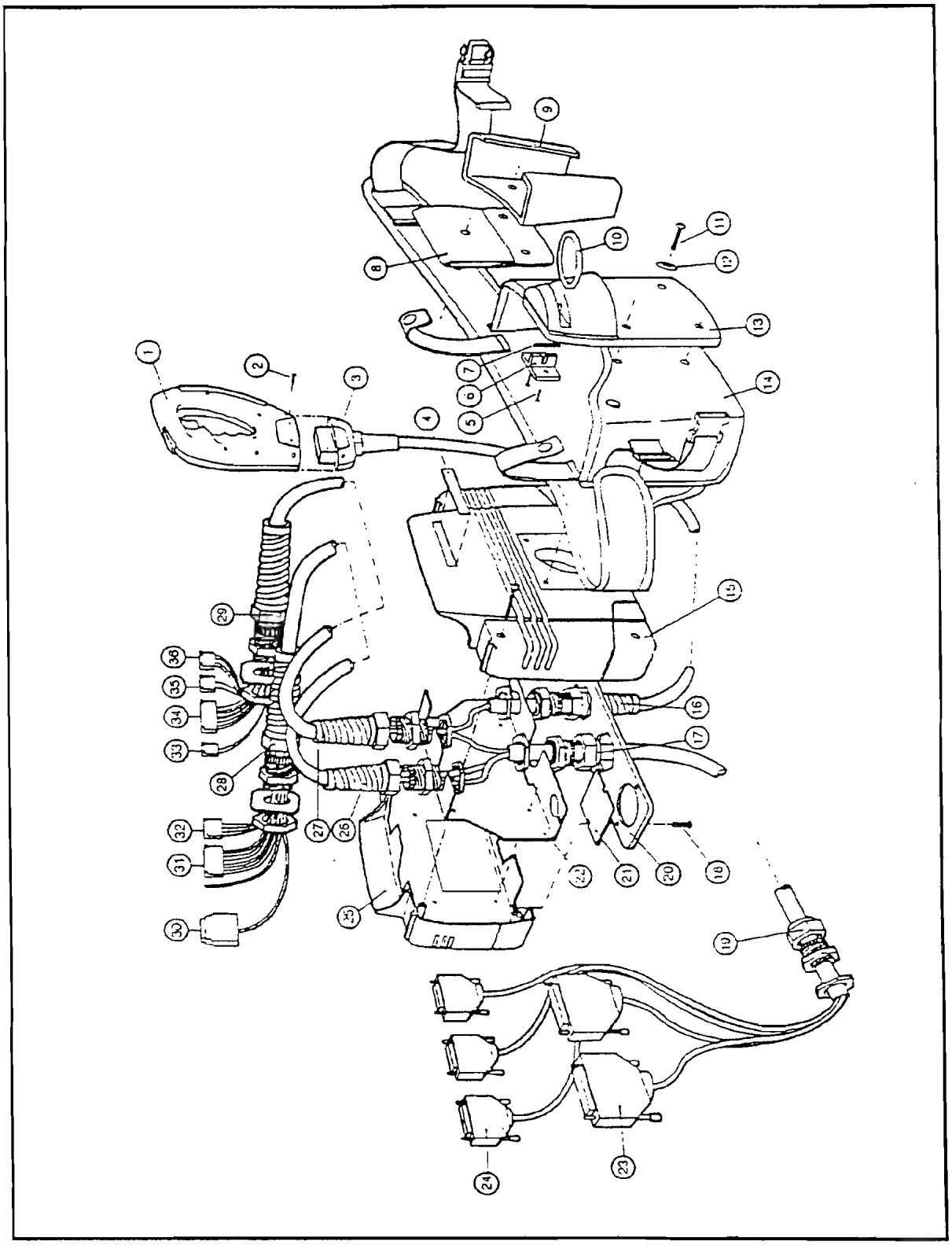
CS VISETTE®
Parts List

ITEM	DESCRIPTION	QTY	PART No.
1	Bottom Casing	1	210 - 006
2	Top Casing	1	210 - 007
3	Cable Entry Int L/H	1	210 - 075
4	Cable Entry Ext L/H	1	210 - 033
5	Cable Entry Int R/H	1	210 - 076
6	Cable Entry Ext R/H	1	210 - 008
7	C.S. Headband Assembly	1	
8	Mirror Box	1	210 - 012
9	Ergolock Assembly	1	210 - 510
10	Facemask	1	210 - 029
11	Microphone Cowl	1	210 - 522
12	Mirophone and Lead	1	210 - 524
13	Headphone	2	210 - 526
14	Headphone Pad	2	210 - 527
15	Cable Entry Plate	2	210 - 031
16	Anchor Plate	2	210 - 010
17	Flex Lock Assembly	2	MIS00136
18	Flex Lock Nut	2	NUT00014
19	Distribution P.C.B. L/H	1	210 - 077
20	Distribution P.C.B. R/H	1	210 - 055
21	Lens	2	210 - 514
22	Lens Retainer	2	210 - 021
23	Bumper Pad	1	210 - 028(colour)
24	Forehead Pad	1	210 - 032
25	Trimming Pad	1	210 - 035
26	Velcro 20mm Loop	15cm	210 - 502L
27	Velcro 20mm Hook	15cm	210 - 502H
28	Screw Posi Csk No 2 x 3/8	15	SCW00066
29	Screw No 2 x 1/2	14	SCW00064
30	Velcro 10mm Hook	15cm	210 - 503H
31	Velcro 10cm Loop	15cm	210 - 503L
32	Screw M3 x 8 Lap Soc	11	SCW00002
33	Screw No 2 x 3/8	2	SCW00065
34	Screw 1.7 x 6	6	SCW00067
35	Acrylic Tape	0.5m	MIS00176
36	Epson Monitor	2	210 - 529M
37	Screw No.2 x 1/4	6	SCW 00063

N.B:- A) On earlier models:
Items 13 and 14 Part Numbers were 210 -513.
Item 3 was Part Number 210-034
Item 5 was part number 210-009

B) On earlier models:
Item 36 were Panasonic Monitors Part Number 210 - 511M.
On CS 1001 to 1087: Item 19 was Part Number 210-054

CS BACKPACK – CS FASTRAK ONLY
Parts List



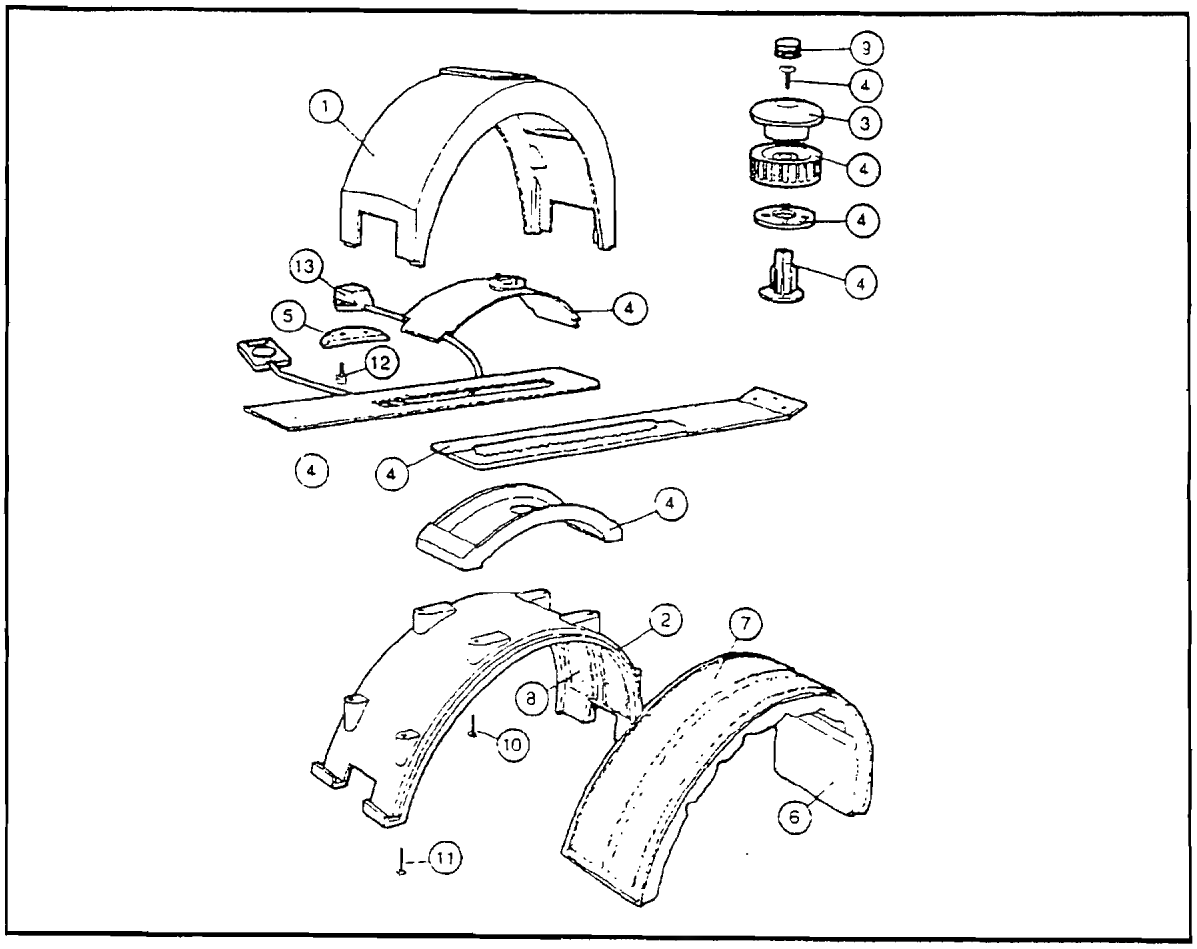
CS BACKPACK – CS FASTRAK ONLY
Parts List

ITEM	DESCRIPTION	PART No.
1	Space Joystick	C.S. SpaceJoy II
2	Polymate Pan Screw	SCW00065
3	Connector Cover L/H and R/H	
4	Virtuality Badge	214 - 524
5	Screw No4 x 3/8	SCW00069
6	Anchor Clamp	221 - 016
7	Anchor Pin	221 - 011
8	Holster Strap	229 - 009
9	SpaceJoy II Holster	229 - 012
10	Retractor Keyring	MIS00235
11	Screw M4 x 12	SCW00032
12	Ext Trim Washer	210 - 509
13	Backpack Anchor/Hook	221 - 009
14	Belt Bag Modified	221 - 500M
15	Backpack Case Rear	221 - 014
16	L.T.F. P.G 13.5	MIS00137
17	L.T.F. P.G 29	
18	Screw M4 x 16	SCW00033
19	L.T.F. P.G 29	
20	Backpack Base Trim	221 - 021
21	Blanking Plate	
22	Backpack Chassis	221 - 020
23	25-Way Visette Connectors L/H and R/H	
24	15-Way Sensors and Joystick Connectors	
25	Backpack Case Front	221 - 013
26	L.T.F. P.G 21 Black Insert	MIS00136
27	L.T.F. P.G 21 Black Insert	MIS00136
28	L.T.F. P.G 21 Grey Insert	MIS00138
29	L.T.F. P.G 21 Grey Insert	MIS00138
30	Sensor Harwin Connector	MIS00286
31	8-Way Molex Connector L/H Video	MIS00162
32	4-Way Molex Connector L/H Audio	MIS00163
33	2-Way Molex Connector - Not Used	MIS00165
34	8-Way Molex Connector R/H Video	MIS00162
35	3-Way Molex Connector Microphone	MIS00164
36	4-Way Molex Connector R/H Audio	MIS00163

NOTE. on later models, item 13 has been replaced by:-

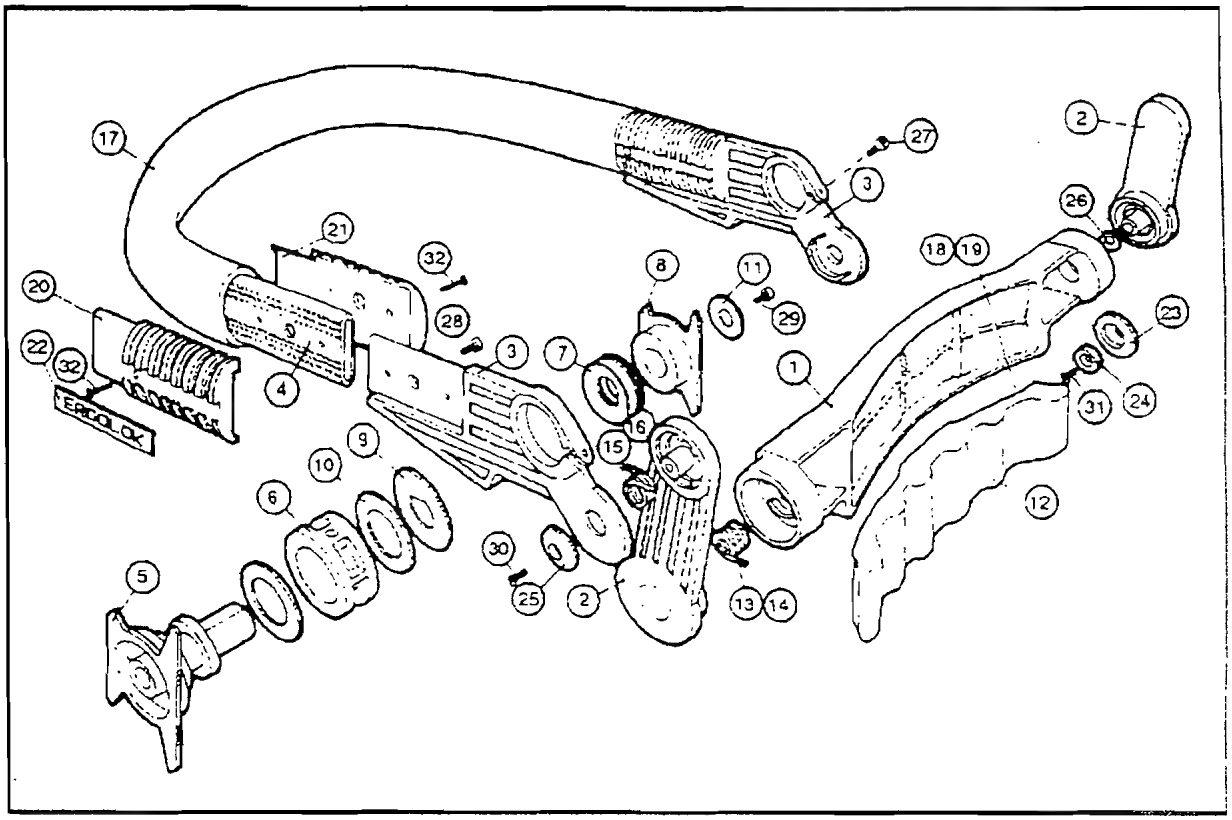
Rectractor Buckle	221-018
Backpack Handle	MIS 00289

CS HEADBAND ASSEMBLY
Parts List



Item	Description	Qty	Code
1	Headband Outer	1	210-042
2	Headband Inner	1	210-025
3	Headband Cap	1	210-037
4	Headband Adjuster Module	1	210-517
5	Sensor Cover	1	210-048
6	Headband Pad	1	210-030M
7	Velcro Hook 10mm	.24m	210-502
8	Velcro Loop	.24m	210-502
9	Headband Cover	1	210-518
10	PT Screw	4	SCW 00064
11	PT Screw	4	SCW 00065
12	Nylon Screw	2	SCW 00117
13	Fastrak Sensor	1	218-525R

ERGOLOK MODULE
Parts List



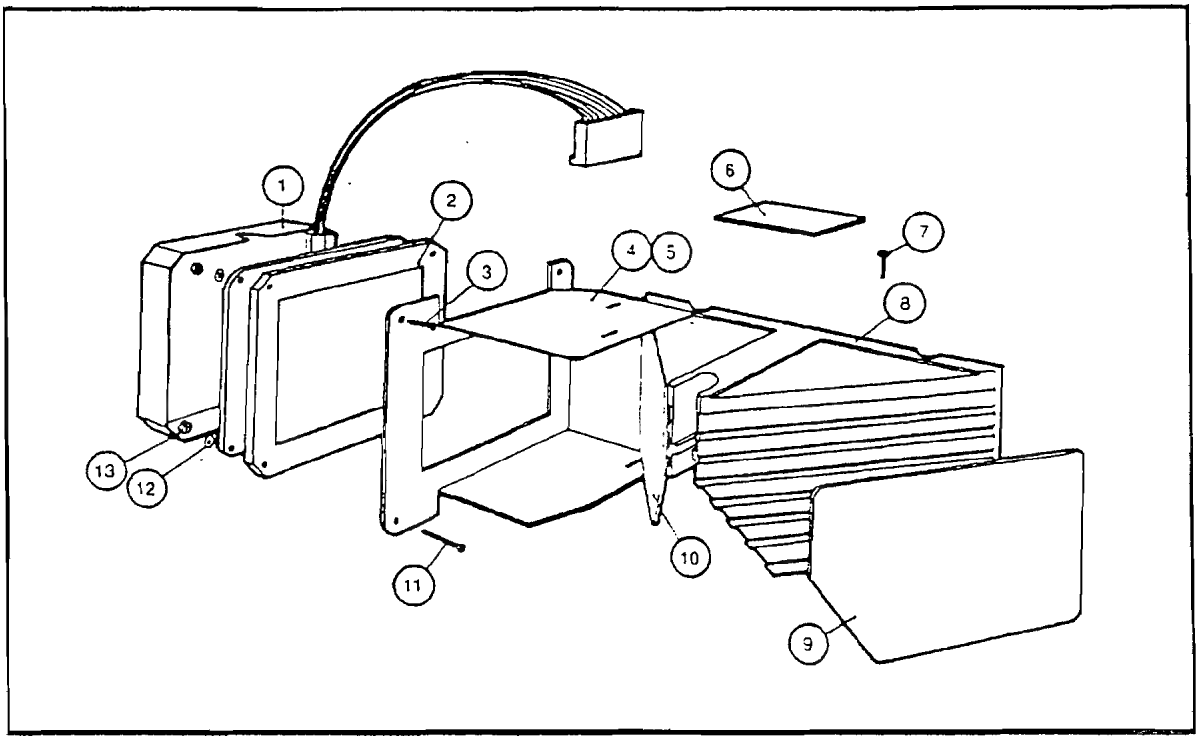
ERGOLOK ASSEMBLY CODE: 210-510

Item	Description	Qty	Code
1.	Neck strap	1	210-071
2.	Pivot link	2	210-018
3.	Arm pivot	2	210-073
4.	Arm extrusion	1	210-020
5.	Clutch	2	210-064
6.	Clutch centre	2	210-066
7	Belleville disc spring	6	MIS-00157
8.	Thrust plate	2	210-065
9.	Reaction washer	2	210-068
10.	Fibre washer	4	210-525
11.	Thrust washer	2	219-069
12.	Neck pad	1	210-017
13.	Torsion spring left hand	1	210-052
14.	Torsion spring right hand	1	210-053
15.	Torsion spring left hand	1	210-051
16.	Torsion spring right hand	1	210-050
17	Nylon sleeve	1	210-051

ERGOLOK MODULE
Parts List

18.	Velcro hook 20m	Strip	210-502H
19.	Velcro loop 20m	Strip	210-502L
20.	Trim outer	2	210-041
21.	Trim inner	2	210-040
22.	Badge ergolok	2	210-500
23.	Black trim washer	2	210-509
24.	White washer 5m	2	210-504
25.	White trim washer	2	MIS-00236
26.	Nylon washer	2	MIS-00036
27.	M 3.5 cap HD	2	SCW 00006
28.	M 3X6 cap.HD	2	SCW 00001
29.	M 4X12 cap	2	SCW 00009
30.	No 4 Pan HD S.Tap	2	SCW 00069
31.	No 4 CSK HD S.Tap	2	SCW 00115
32.	No 2 pan SD S.Tap	4	SCW 00065

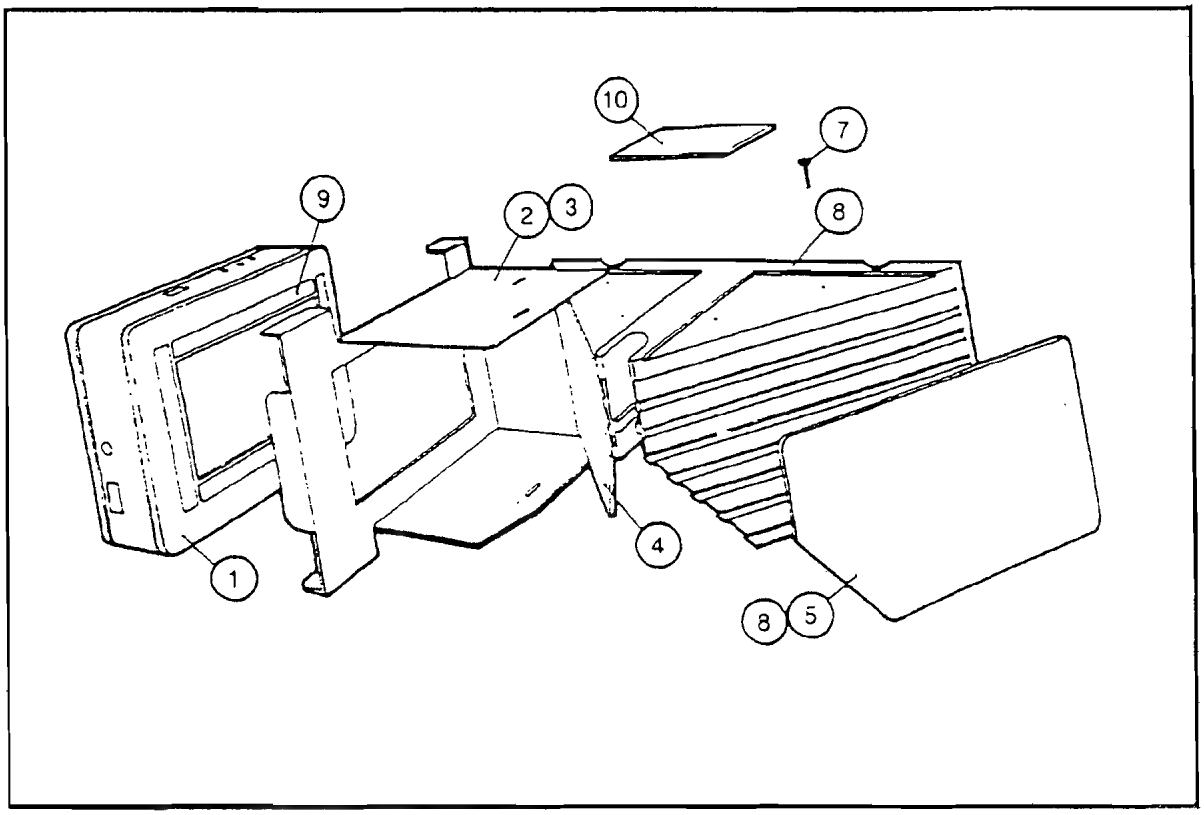
EPSON MONITOR BOX
Parts List



Item	Description	Qty	Code
1.	LCD rear cover	2	
2.	Epson LCD monitor	2	210-529M
3.	M2 x 12 screw	4	SCW 00127
4.	Monitor bracket left hand	1	210-078
5.	Monitor bracket right hand	1	210-079
6.	Calibration label	1	MIS 00294
7.	Screw No 2 x 1/4	6	SCW 00063
8.	Mirror box	1	210-012
9.	Mirror right hand	1	210-011R
10.	Mirror left hand	1	210-011L
11	M2 x 25 screw	4	SCW 00125
12.	Washer M2	8	WSH 00022
13.	M2 nut	8	NUT 00021

NOT SHOWN: 2x Acrylic filter – Part No: 210-532
Fitted between items 2 and 4.

PANASONIC MONITOR BOX
Parts List



Item	Description	Qty	Code
1.	LCD monitor	2	210-511M
2.	Monitor bracket left hand	1	210-013
3.	Monitor bracket right hand	1	210-015
4.	Mirror left hand	1	210-011L
5.	Mirror right hand	1	210-011R
6.	Mirror box	1	210-012
7.	Pan HD No 2 PT	6	SCW 00063
8.	3M Tactape	.20m	MIS 00293
9.	3M Acrylic tape	.25m	MIS 00175
10.	Calibration label	1	MIS 00294

NOT SHOWN: 2x Acrylic filter – Part No: 210-533
Fitted inside monitor housing

Visette® Monitor Realignment Procedure

From time to time the monitors mounted inside the visette® may need re-aligning if the vision becomes blurred. To enable this procedure to be carried out, disconnect the visette® from the unit as described on Page 3.13

Take the visette® to a clean working area where it can be opened.
Refer to diagram on Page 3.1

1. Carefully remove the virtuality foam pad using finger tips, being careful not to tear any foam - this pad will need to be placed back onto the visette® when the work is completed.

2. Using a cross-point screwdriver - remove the 7 screws around the front rim of the visette®.

3. With the visette® positioned upside-down, remove the 8 screws (item 29) using a ground-down IPT screwdriver or OPT screwdriver. Be careful not to damage the screw heads.

4. Remove the 2 screws (if fitted) located under the trimming pad (item 25).

5. Place the visette® the correct way up and remove the two 2.5 mm hex screws on the outer side of the ergolok clutch mechanism.

6. Remove forehead pad (item 24).

7. Carefully lift the top half of the Visette® clear of the bottom half.

8. Unscrew the 3 2.5 mm hex screws securing the monitor box assembly and remove - being careful not to scratch the surfaces of the lenses whilst removing/re-inserting monitor box.

WARNING : Do not touch the mirrors with any part of the hand. If they need to be cleaned use a very soft lint-free cloth, applying the minimum of pressure.
Refer to diagram on Page 3.8

9. Hold the monitor box in front of the face and if the reflections on the mirrors of the top of the monitor screen do not line up, release the screw on the underside of the monitor box and slide the bracket so the monitors line up with each other - secure all screws when alignment is achieved.

10. A more accurate check may now be carried out using the E.T.S. System Page 8.9 Figure 9

11. Locate the monitor box assembly back into the Visette® bottom half only and re-fit the forehead pad.

12. Connect the monitors on to the loom using the distribution P.C.B. and switch unit on. Ensuring L/H loom is connected to L/H monitor and R/H loom is connected to R/H monitor.

13. When the unit has powered-up, select E.T.S. F6 Visette® stereo alignment (page 8.3).

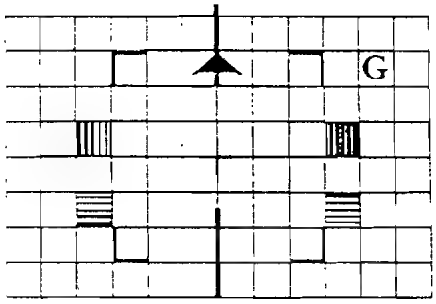
14. Using the grid image, set the brightness of both monitors so they are equal.

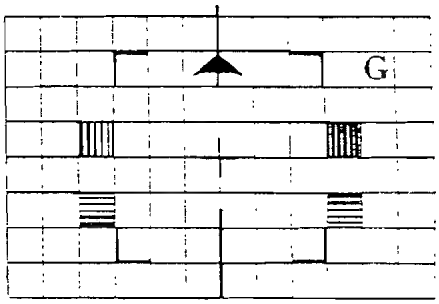
15. Look into the Visette® and ensure both grid images overlap exactly. If they do not, remove the monitor box again and slide monitor brackets by releasing appropriate screws. Repeat 14 and 15 until alignment is exact. Tighten all screws.

16. Re-assemble Visette®, ensuring no dust/hairs are inside the case.

17. Re-connect to unit and continue operation.

EXAMPLE OF GRID IMAGES WHICH SHOULD OVERLAP





Ergolok Clutch and Headband Adjustment

ERGOLOK CLUTCH PAGE 3.6

If the clutch mechanism becomes too loose, it is possible to increase the torque by tightening the 3 mm hexagonal headed bolt (item 29) approximately one eighth of a turn on each side.

Should the mechanism remain loose, remove the L/H and R/H Visette® side entry mouldings and tighten the clamp which surrounds the clutch centre with the 2.5 mm/3.0 mm bolt (item 27).

HEADBAND ADJUSTMENT PAGE 3.5

Should the headband ratchet mechanism become loose, take out the headband cover (item 9) and tighten the headband adjuster module screw (item 4) with a IPT screwdriver, until the correct torque is achieved.

DISCONNECTING/CONNECTING A VISETTE® ON THE CS/SU UNITS

This operation can be carried out with the loom still in the console. However, if the loom is also to be removed, then it is best to take the complete assembly to a bench or table top for ease of working and disconnect the Visette® at that stage.

1. Using the 'O' point posidnve screwdriver, carefully unscrew the three fixing screws located on each headphone moulding. Note that the front screw is slightly shorter than the two at the rear. Be careful not to damage the screw heads - the screws are of the self-tapping type and may be tight, so ample pressure and torque needs to be applied initially to free them.
When all three screws have been removed, the outer cover can be separated from the inner headphone. If a 'P' clip is fitted to anchor the cable, remove the screw to release the cable and refit to keep the clip safe.

2. Using the 2.5 mm Allen key, unscrew the aluminium fixing plate that locates the two mouldings just removed. Keep the three screws - the plate will be on the wire.

3. Access can now be obtained to the Molex connectors on the PCB in the Visette®. The PCB can be dropped down slightly to assist access. All the plugs in the row should be removed, A small flat bladed tool helps with these connectors (lift the two locks to release the connectors).

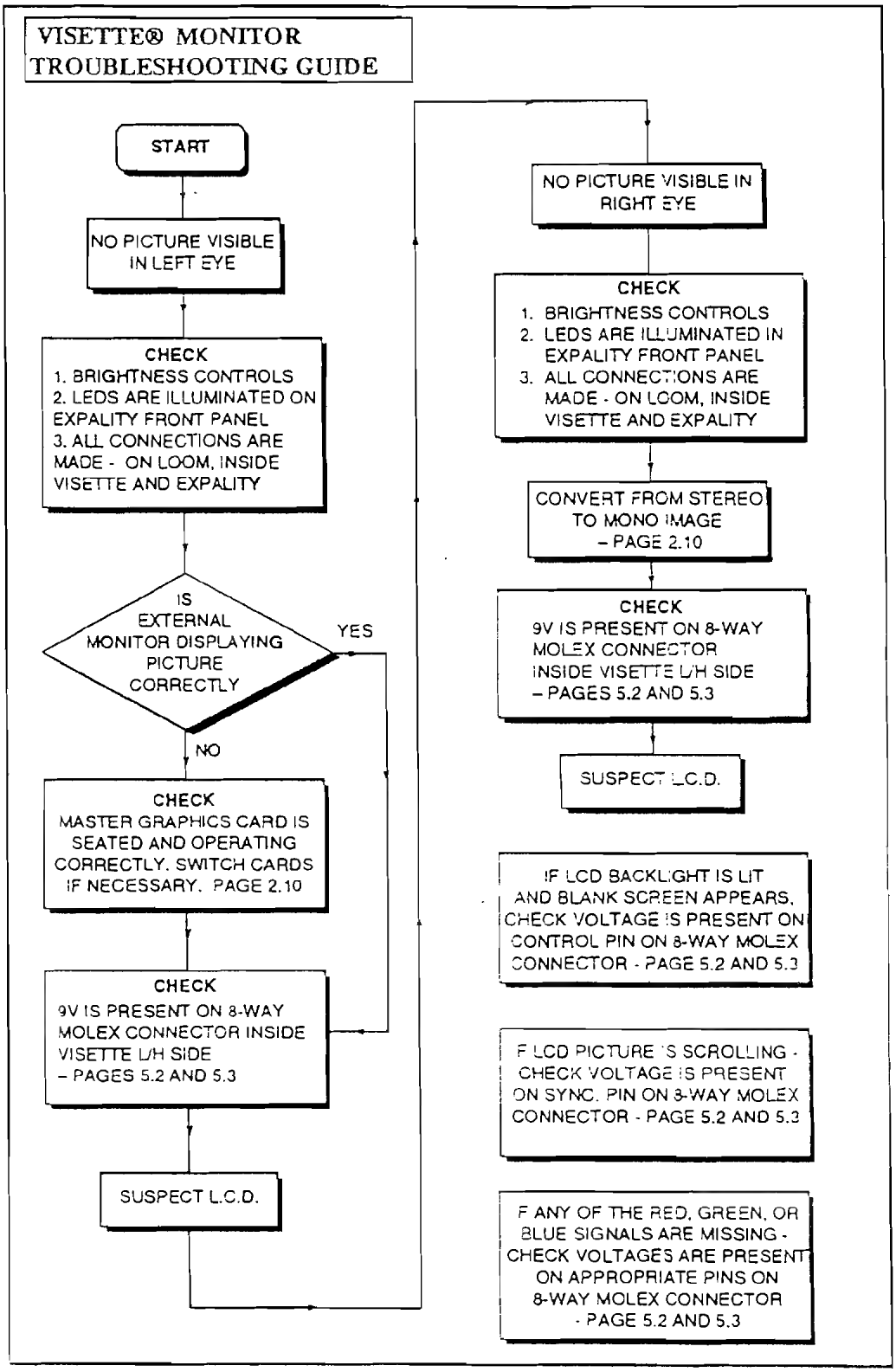
4. Once all the connectors have been taken off and the cable is free, carry out the work intended on the visette.

5. To reconnect the visette follow the next procedure : Reconnect the sockets on the loom to the PCB. Ensure you have the appropriate cable for the Left or Right side that is being worked on, and that the cable is not twisted.

6. Having reconnected the Molex plugs, fasten the plate with the three fixing screws - ensure that all three screws are tight - but do not over torque as the insert can be damaged.

7 The final stage of re-assembly is the two outer mouldings. Ensure the cable locating plate on the spiral gland is seated in its groove (flat side to the headphone moulding). The aluminium retension plate is the key to easy re-assembly and should be used as the location guide. When they are both correctly located on this plate, the assembly should snap together. Ensure the headphone cable is not trapped.
Replace the screw at the front and then the two 12mm screws at the rear and tighten. Check that the mouldings are fully closed and the operation is complete.

8. Repeat the exercise for the other side, noting that the Right Hand side has four connectors, the Left Hand side has three See Visette® umbilical loom for details.


VISETTE® MONITOR
TROUBLESHOOTING GUIDE
START
NO PICTURE VISIBLE IN LEFT EYE
CHECK
1. BRIGHTNESS CONTROLS
2. LEDS ARE ILLUMINATED ON EXPALITY FRONT PANEL
3. ALL CONNECTIONS ARE MADE - ON LOOM, INSIDE VISETTE AND EXPALITY
IS EXTERNAL MONITOR DISPLAYING PICTURE CORRECTLY
YES
NO
CHECK
MASTER GRAPHICS CARD IS SEATED AND OPERATING CORRECTLY. SWITCH CARDS IF NECESSARY. PAGE 2.10
CHECK
9V IS PRESENT ON 8-WAY MOLEX CONNECTOR INSIDE VISETTE L/H SIDE
– PAGES 5.2 AND 5.3
SUSPECT L.C.D.
NO PICTURE VISIBLE IN RIGHT EYE
CHECK
1. BRIGHTNESS CONTROLS
2. LEDS ARE ILLUMINATED IN EXPALITY FRONT PANEL
3. ALL CONNECTIONS ARE MADE - ON LOOM, INSIDE VISETTE AND EXPALITY
CONVERT FROM STEREO TO MONO IMAGE
– PAGE 2.10
CHECK
9V IS PRESENT ON 8-WAY MOLEX CONNECTOR INSIDE VISETTE L/H SIDE
– PAGES 5.2 AND 5.3
SUSPECT L.C.D.
IF LCD BACKLIGHT IS LIT AND BLANK SCREEN APPEARS, CHECK VOLTAGE IS PRESENT ON CONTROL PIN ON 8-WAY MOLEX CONNECTOR - PAGE 5.2 AND 5.3
F LCD PICTURE IS SCROLLING - CHECK VOLTAGE IS PRESENT ON SYNC. PIN ON 8-WAY MOLEX CONNECTOR - PAGE 5.2 AND 5.3
F ANY OF THE RED, GREEN, OR BLUE SIGNALS ARE MISSING - CHECK VOLTAGES ARE PRESENT ON APPROPRIATE PINS ON 8-WAY MOLEX CONNECTOR - PAGE 5.2 AND 5.3

PAGE

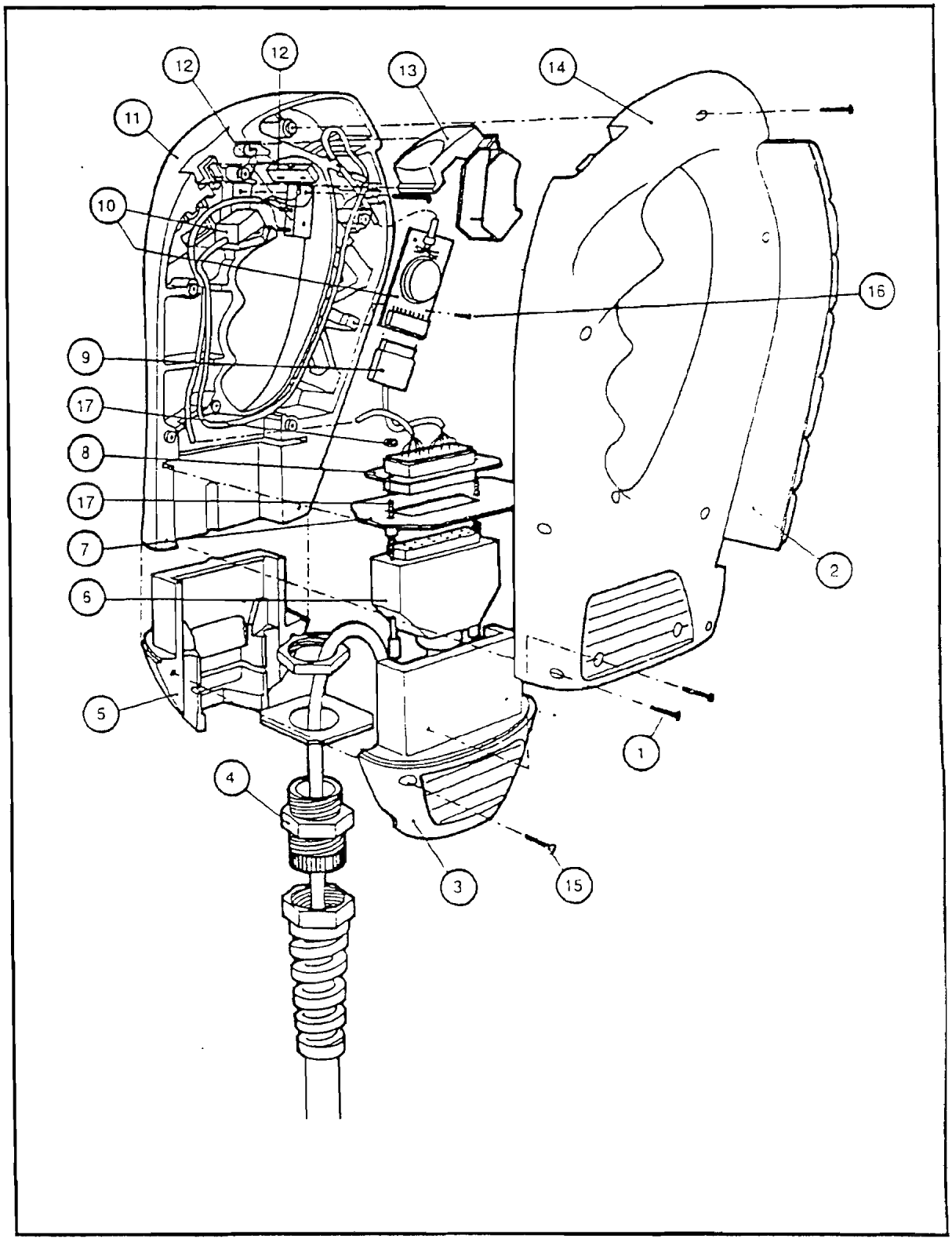
4.1 Space joystick II – Exploded View

4.2 Space joystick II – Parts List

4.3 Space joystick I – Exploded View

4.4 Space joystick I – Parts List

CS SPACE JOYSTICK II
Parts List

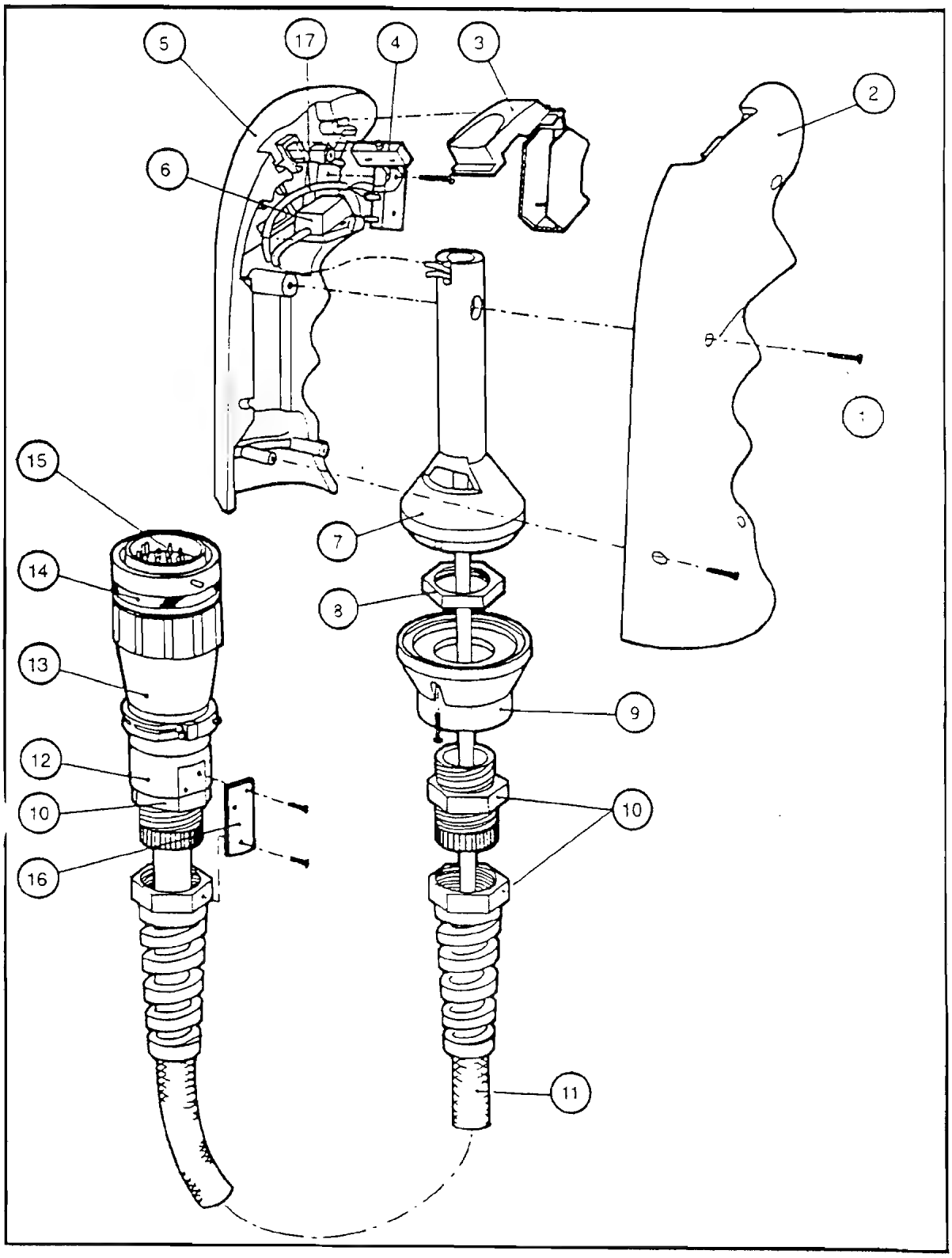


CS SPACE JOYSTICK II
Parts List

CS SPACE JOYSTICK MARK II

Item	Description	Qty	Part No
1	POLYMATE PAN SCREW	15	SCW 00065
2	HEADBAND PAD (MODIFIED)	1	210-030
3	CONNECTOR COVER R/H	1	229-006
4	PG 13.5 L.T.F	1	MIS 00137
5	CONNECTOR COVER L/H	1	229-007
6	25-WAY D-HOOD	1	MIS 00352
7	CONNECTOR PLATE	1	229-001
8	INTERNAL SENSOR LOOM	1	229-008
9	12-WAY HARWIN COVER	1	MIS 0028
10	FASTRAK RECEIVER & EPROM	1	218-525R
11	JOYSTICK HANDLE L/H	1	229-005
12	MICROSWITCH	2	209-022
13	BUTTON MOULDING	1	209-012
14	JOYSTICK HANDLE R/H	1	229-004
15	SKT CAP HD M3 X 16	2	SCW 00004
16	THREAD FORMING SCREW 1.7 X 6	2	SCW 00067
17	SCREW POST	2	MIS 00042

CS SPACE JOYSTICK I
Parts List



CS SPACE JOYSTICK I
Parts List

Item	Description	Qty	Part No
1	POLYMATE PAN SCREW	9	SCW 00065
2	JOYSTICK GRIP R/H	1	209-019
3	BUTTON MOULDING	1	209-012
4	MICROSWITCH	2	209-022
5	JOYSTICK GRIP L/H	1	209-018
6	J/S TRACKER SENSOR	1	213-523/S
7	SPACE J/S SHAFT ADAPTOR	1	214-538
8	PG 13.5 NUT	2	MIS 00137
9	FLEX LOCK ADAPTOR	1	214-539
10	PG 13.5 L.T.F	2	MIS 00137
11	CONDUIT	1.5M	MIS 00156
12	CONDUIT CONNECTOR	1	209-024
13	23-WAY COVER	1	MIS 00021
14	23-WAY PLUG	1	MIS 00024
15	SOLDER PINS	13	MIS 00186
16	CLAMP	1	209-025
17	JOYSTICK CABLE	1.5M	CC00642

PAGE

5.1 CS Fastrak Loom
5.2 Visette® (Fastrak) – Cable entry end of PCB
5.3 Visette® – Top end of PCB
5.4 Space Joystick II
5.5 CS Tracker Loom
SU with Glove Loom
5.6 Visette® (Tracker) – Cable entry end of PCB
5.7 Visette® (Tracker) – Top end of PCB
5.8 Fastrak Source/Transmitter
5.9 Tracker Source/Transmitter
5.10 Left Hand Visette®
5.11 Right Hand Visette®

Connector Pinout for Loom on CS1000 Fastrak

	CS 15-Pin D Type Socket	SIGNAL	
JOYSTICK	15 Red 14 Blue 13 Yellow 12 Green 9 Screen	TRIGGER Button TOP Button	
	15-Pin D-Type Socket T1 and T2		
FASTRAK	7 Red 14 Brown 13 Yellow 6 Blue 8 Black 15 White 9 Green 1 Orange 2 Screen 5 Screen	☐ Coil = 95 Ohm ☐ Coil = 95 Ohm ☐ Coil = 95 Ohm ☐ Calibration Coil = 4 Ohm Calibration Coil Screen Position Coils Screen	

VISETTE® PCB CONNECTOR PINOUT FOR CS FASTRAK - Serial No.s 1088 onwards.

(NOTE: Cable entry end of PCB)

LEFT VISETTE DISTRIBUTION P.C.B.			RIGHT VISETTE DISTRIBUTION P.C.B.		
PIN	**COLOUR**	**SIGNAL**	**PIN**	**COLOUR**	**SIGNAL**
VIDEO			**VIDEO**		
8 Way 8	Red	R	8 Way 8	Red	R
Molex 7	Green	G	Molex 7	Green	G
6	Blue	B	6	Blue	B
5	Screen/Black	VGND	5	Screen/Black	VGND
4	Yellow	SYNC	4	Yellow	SYNC
3	White	CNTRL	3	White	CNTRL
2	Orange	-9V	2	Orange	-9V
1	Black	OV	1	Black	OV
AUDIO			**AUDIO**		
4 Way 4	Blue	Aud L	4 Way 4	Blue	Aud R
Molex 3	Screen	Return	Molex 3	Screen	Return
2	Red	Quad L	2	Red	Quad R
1	Screen	Return	1	Screen	Return
Fastrak 12 - Way Datamate Harwin Connector			**5 V Supply** 2 Way Molex		
			2	Red +5V	
			1	Blue 0V	
X Coil 1	Black – Coil =		**Microphone** 3 Way Molex		
7	White – 95 Ohms		3	No Connection	
Y Coil 2	Red – Coil =		2	Yellow	MIC
9	Brown – 95 Ohms		1	Screen	RETURN
Z Coil 5	Blue – Coil =				
10	Yellow – 95 Ohms				
Calibration 6	Green – Coil =				
Coil 12	Orange – 4 Ohms				
3	Purple PROM Data				
4	Grey PROM Data				
8	Screen				
11	Screen				

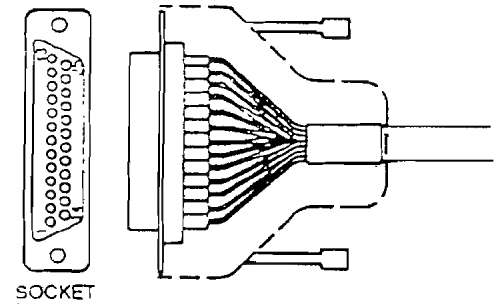
VISETTE® PCB CONNECTOR PINOUT FOR CS FASTRAK

(NOTE: Top end of PCB)

LEFT VISETTE DISTRIBUTION P.C.B.				RIGHT VISETTE DISTRIBUTION P.C.B.			
PIN		COLOUR	SIGNAL	PIN		COLOUR	SIGNAL
VIDEO 8 Way	1	Red	R	VIDEO 8 Way	1	Red	R
	2	Green	G		2	Green	G
	3	Blue	B		3	Blue	B
	4	Brown	VGND		4	Brown	VGND
	5	Yellow	SYNC		5	Yellow	SYNC
	6	White	CNTRL		6	White	CNTRL
	7	Purple	+9V		7	Purple	+9V
	8	Black	OV		8	Black	OV
AUDIO 4 Way	1	Black	Audio	AUDIO 4 Way	1	Black	Audio
	2				2		
	3				3		
	4	Red	Return		4	Red	Return
		FASTRAK SENSOR		5 V Supply 2 Way			
					1	No Connection	
					2	No Connection	
				Microphone 3 Way			
					1	No Connection	
					2	Blue	MIC
					3	Screen	RETURN

SPACE JOYSTICK II CONNECTOR			
CABLE TYPE	COLOUR	PIN No.s	COMMENTS
1 Pair Screened	Orange	1	Calibration Coil
	Green	14	
	Screen	2	
1 Pair Unscreened	Grey	4	PROM GND
	Purple	17	PROM DATA
3 Pairs Screened	Blue	6	Z Coil
	Yellow	18	
	Red	7	Y Coil
	Brown	19	
	Black	8	X Coil
	White	20	
	Screen	5	
2 Pairs Unscreened	Red	10	Trigger Button
	Blue	11	
	Yellow	12	Top Button
	Green	13	

25-WAY D-TYPE CONNECTOR



SOCKET
(Rear View)

Connector Pinout for Loom on CS1000 and SU1000

	CS 15-Pin D Type Socket	23-Pin Connector on Backpack	SU 9pin
JOYSTICK	15 Red 14 Blue 13 Yellow 12 Green 9 Screen	A B TRIGGER Button C D TOP Button Z	9 10 11 12 15
	25-Pin D-Type Socket		
GLOVE SIGNAL Not Applicable To C.S.	1 Brown 2 Red 3 Orange 4 Yellow 5 Green 6 Blue White Black 17 Screen	E F G H J K M 9.5v Molex Pin 1 N 0v P GND Molex Pin 2	
	15-Pin D-Type Socket T1 and T2		
TRACKER	1 Red 2 3 Green 4 Yellow 5 Blue 6 7 Brown 8 Black 9 White 15 Screen	R 1 2 S 3 T 4 Coil = 97 Ohm U 5 6 V 7 W 8 Coil = 97 Ohm X 9 Y 15	Coil = 97 Ohm

VISETTE® PCB CONNECTOR PINOUT FOR CS/SU Unit - Serial No.s CS1001 to CS1087

NOTE: Cable entry end of PCB)

LEFT VISETTE DISTRIBUTION P.C.B.				RIGHT VISETTE DISTRIBUTION P.C.B.			
PIN		**COLOUR**	**SIGNAL**	**PIN**		**COLOUR**	**SIGNAL**
VIDEO				**VIDEO**			
8 Way Molex	8	Red	R	8 Way Molex	8	Red	R
	7	Green	G		7	Green	G
	6	Blue	B		6	Blue	B
	5	Screen/Black	VGND		5	Screen/Black	VGND
	4	Yellow	SYNC		4	Yellow	SYNC
	3	White	CNTRL		3	White	CNTRL
	2	Orange	+9V		2	Orange	+9V
	1	Black	OV		1	Black	OV
AUDIO				**AUDIO**			
4 Way Molex	4	Blue	Aud L	4 Way Molex	4	Blue	Aud R
	3	Screen	Return		3	Screen	Return
	2	Red	Quad L		2	Red	Quad R
	1	Screen	Return		1	Screen	Return
Tracker 9 - Way Molex				**5 V Supply** 2 Way Molex			
	9	White – Coil =			2	Red +5V	
	8	Black – 94 Ohms			1	Blue 0V	
	7	Brown – Coil =		**Microphone** 3 Way Molex			
	6	Red – 94 Ohms			1	No Connection	
	5	Yellow – Coil =			2	Yellow	MIC
	4	Blue – 94 Ohms			3	Screen	RETURN
	3	Green*					
	2	Screen*					
	1						

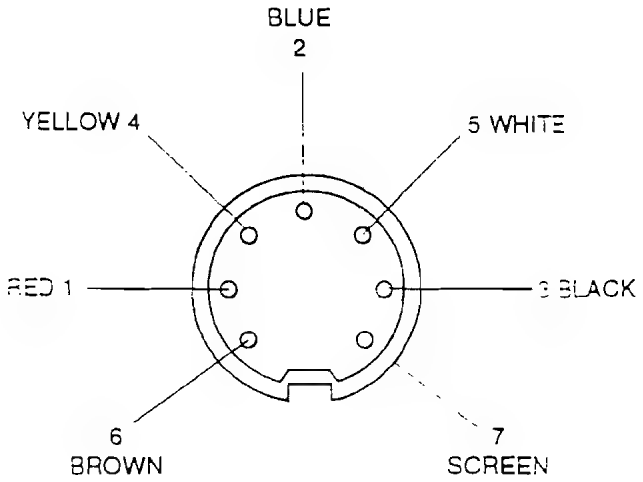
* Connected but not used

VISETTE® PCB CONNECTOR PINOUT POLHEMUS TRACKER

(NOTE: Top end of PCB)

LEFT VISETTE DISTRIBUTION P.C.B.			RIGHT VISETTE DISTRIBUTION P.C.B.		
PIN	COLOUR	SIGNAL	PIN	COLOUR	SIGNAL
VIDEO 8 Way 1	Red	R	VIDEO 8 Way 1	Red	R
2	Green	G	2	Green	G
3	Blue	B	3	Blue	B
4	Brown	VGND	4	Brown	VGND
5	Yellow	SYNC	5	Yellow	SYNC
6	White	CNTRL	6	White	CNTRL
7	Purple	+9V	7	Purple	+9V
8	Black	OV	8	Black	OV
AUDIO 4 Way 1	Red	Aud L	AUDIO 4 Way 1	Red	Aud R
2	Black	Return	2	Black	Return
3	White	Quad L	3	White	Quad R
4	Green	Return	4	Green	Return
Tracker 9 - Way			5 V Supply 2 Way		
			1	No Connection	
1	White ┐ Coil ≈		2	No Connection	
2	Black ┘ 94 Ohms				
3	Brown ─ Coil ≈		Microphone 3 Way		
4	Red ─ 94 Ohms		1	No Connection	
5	Yellow ─ Coil ≈		2	Blue	MIC
6	Blue ─ 94 Ohms		3	Screen	RETURN
7	Green*				
8	Screen*				
9					
	* Connected but not used				

POLHEMUS FASTRAK SOURCE



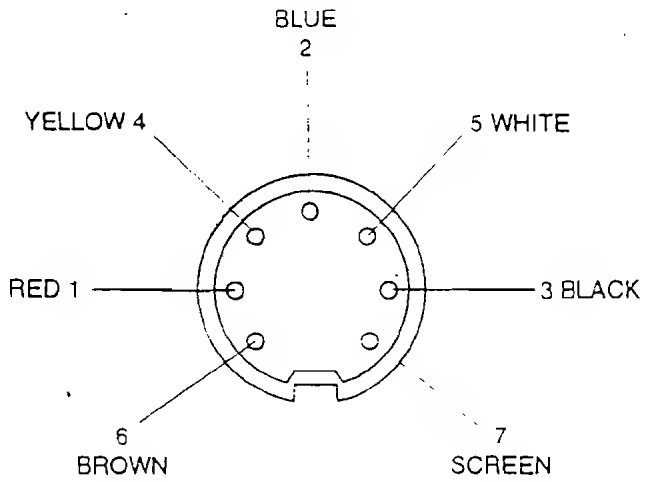
SOURCE DIN PLUG (7PIN) PINOUT DATA

PINOUT FOR CS

CS No.s CS1088 ONWARDS

	15-Pin D-Type Socket		
FASTRAK SOURCE	1 Red	1 ———	
	2	2	
	3	3	
	4 Yellow	4 ⎫ Coil =	Coil =
	5 Blue	5 ⎭ 2.8 Ohms	2.8 Ohms
	6	6	
	7 Brown	7 ———	
	8 Black	8 ⎫ Coil =	
	9 White	9 ⎭ 2.8 Ohms	
	15 Screen	15	

POLHEMUS TRACKER SOURCE



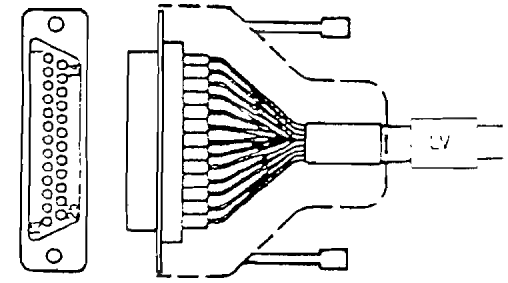
SOURCE DIN PLUG (7PIN) PINOUT DATA

TRACKER PINOUT FOR CS/SU

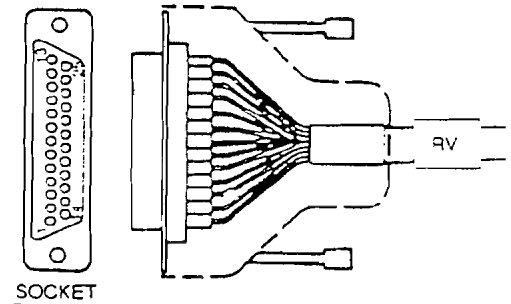
CS No.s CS1001– CS1097

	15-Pin D-Type Socket		
TRACKER SOURCE	1 Red	1	Coil = 10 Ohms
	2	2	
	3 Green	3	
	4 Yellow	4	Coil = 10 Ohms
	5 Blue	5	
	6	6	
	7 Brown	7	Coil = 10 Ohms
	8 Black	8	
	9 White	9	
	15 Screen	15	

LEFT HAND VISETTE®			
CABLE TYPE	COLOUR	PIN No.s	COMMENTS
6 Core Screened	Red	1	Red Signal
	Green	2	Green Signal
	Blue	3	Blue Signal
	Yellow	4	Sync
	Black	14, 15, 16	GND
	White	17	Control
	Screen	14	
1 Core Screened	Blue	8	Audio
	Screen	21	
1 Core Screened	Red	9	Audio
	Screen	22	
1 Core Screened	Yellow		Unused
	Screen		Unused
Singles	Orange	5, 6, 18	+9v
	Black	7, 19, 20	0v
	Red		Unused
	Blue		Unused



RIGHT HAND VISETTE®			
CABLE TYPE	COLOUR	PIN No.s	COMMENTS
6 Core Screened	Red	1	Red Signal
	Green	2	Green Signal
	Blue	3	Blue Signal
	Yellow	4	Sync
	Black	14, 15, 16	GND
	White	17	Control
	Screen	14	
1 Core Screened	Blue	8	Audio
	Screen	21	
1 Core Screened	Red	9	Audio
	Screen	22	
1 Core Screened	Yellow	12	Microphone
	Screen	13	
Singles	Orange	5, 6, 18	+9v
	Black	7, 19, 20	0v
	Red	10, 23	+5v
	Blue	11, 24	0v



SOCKET
(Rear View)

PAGE

6.1 Limitations and Frequency Modules
6.2 Fastrak Dipswitch Settings
6.3 Tracker Dipswitch Settings
6.4 Tracking Components
6.5 Fastrak Visette® Sensor
6.6 Fastrak Joystick Sensor
6.7 Fastrak 12-way Datamate Connector
6.8 Fastrak Board
6.9 Fastrak Troubleshooting Guide
6.10 Tracker Troubleshooting Guide

POLHEMUS FASTRAK SYSTEM

The Fastrak tracking device uses electromagnetism for detecting the X, Y and Z positions of the sensors. Therefore large metallic objects or constructions sited close to the unit or in a low ceiling may cause interference.

Other forms of interference may be experienced if large external monitors or TVs are in the range of the tracking system.

This interference can appear as an unsteady or slanted effect in the picture. It is recommended that monitors are positioned approximately 3 metres from the unit and ceilings should be a minimum of 2.5 metres with very little metallic objects above the ceiling level or in the ceiling construction.

The Fastrak can run at one of four frequences selected by a plug in frequency module. These allow up to 4 units to be operated in close proximity with no interference experienced.

These modules are colour coded and fitted as follows :-

CS COLOUR	FREQUENCY MODULE COLOUR
Yellow	Yellow
Blue	Blue
Green	Black
Orange	Red

NOTE:
Tracker and Fastrak are registered trade marks of Polhemus Inc. USA

FASTRAK DIP SWITCH SETTINGS

The Polhemus Fastrak Board contains two sets of DIP switches, one eight way (S2) which sets the details of the interface to the board, and one four way (S1) which is used to select active sensors. These switches must be set correctly, otherwise the board will not work.

Revision C and earlier boards only use switch 8 on S2, this selects the RS 232 interface. The newer revision D and E boards (identifiable by the power L.E.D.) use the other 7 switches to set baud rate/parity etc. The revision C boards ignore these 7 switches, so it is possible to use revision D and E settings on a revision C board. The switch settings given here will therefore work on all Fastrak boards.

Note : Some of the switches vary in make and having the switch UP may not necessarily mean ON. The ON position is labelled on each switch.

S1 - 4 WAY	S2 - 8 WAY
1 - OFF	1 - ON
2 - ON	2 - ON
3 - OFF	3 - OFF
4 - ON	4 - OFF
ON = SENSOR INHIBITED	5 - ON
	6 - OFF
	7 - OFF
	8 - ON

TRACKER DIPSWITCH SETTINGS

S1

1	CLOSED
2	CLOSED
3	OPEN
4	CLOSED
5	CLOSED
6	CLOSED
7	CLOSED
8	CLOSED

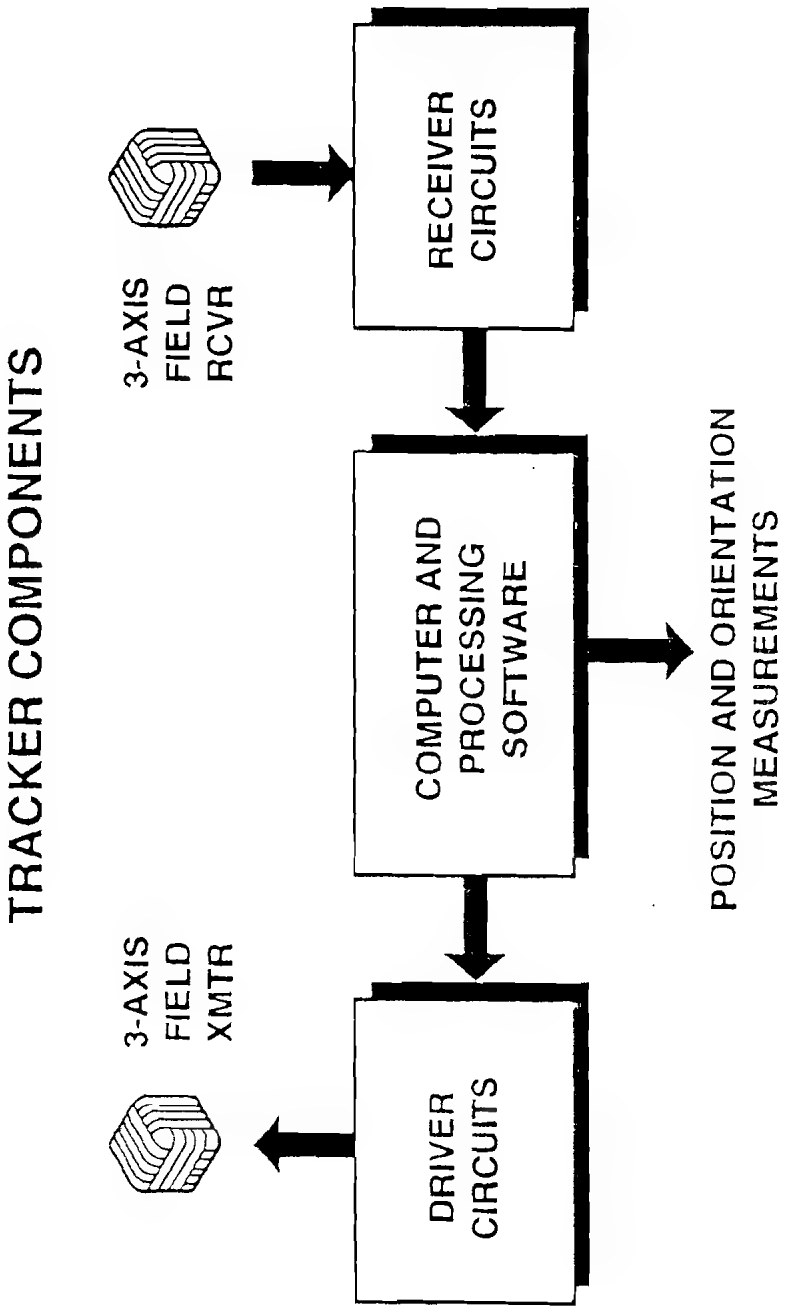
S2

1	CLOSED
2	CLOSED
3	CLOSED
4	CLOSED
5	CLOSED
6	CLOSED
7	OPEN
8	OPEN

S3

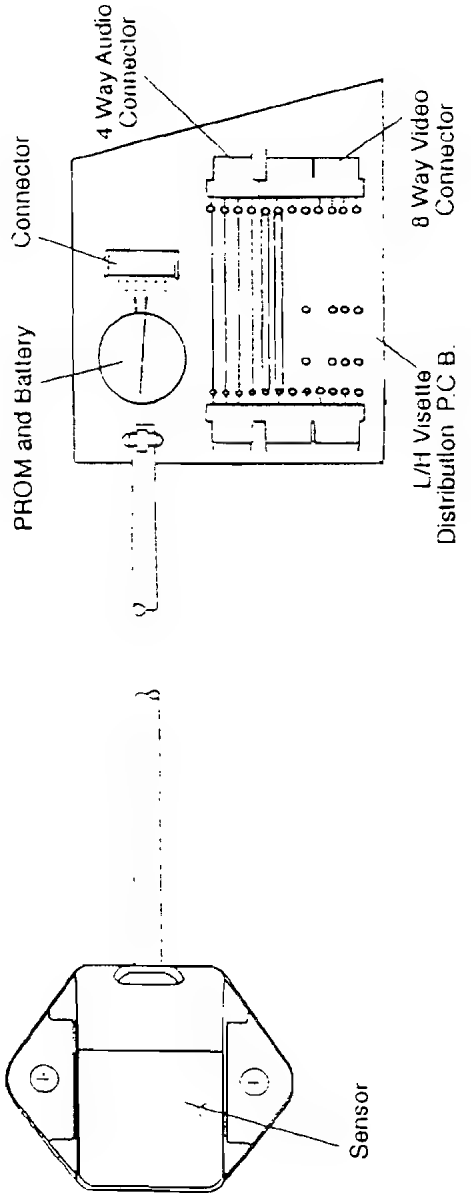
1	CLOSED
2	CLOSED
3	CLOSED
4	CLOSED
5	CLOSED
6	CLOSED
7	CLOSED
8	CLOSED

Tracker Components

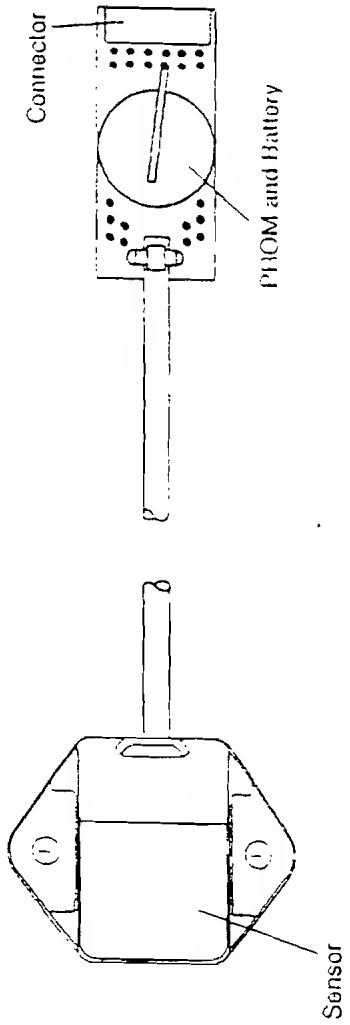


L/H VISETTE® DISTRIBUTION PCB

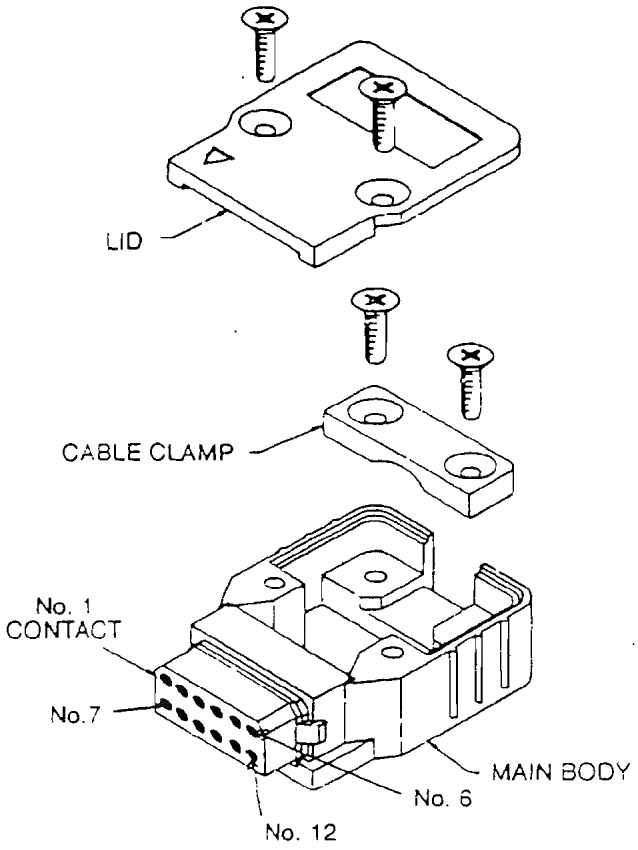
Visette® Sensor



Joystick II Sensor

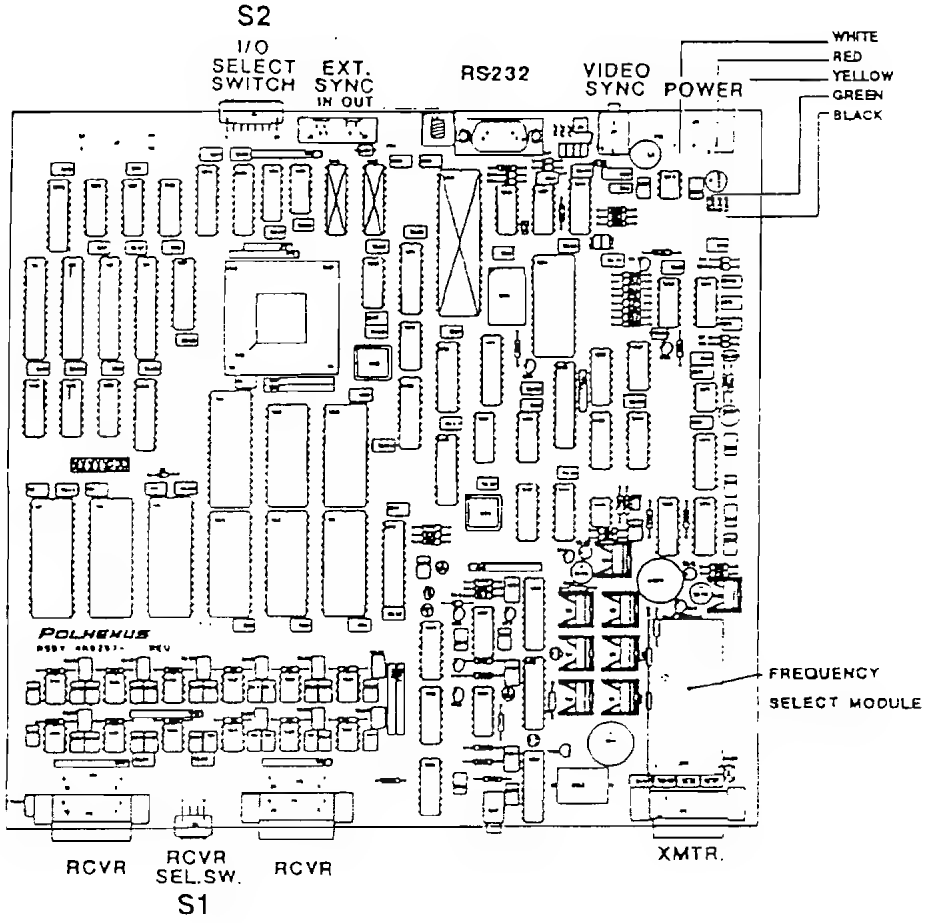


12 Way Harwin Connector to Fastrak Sensor

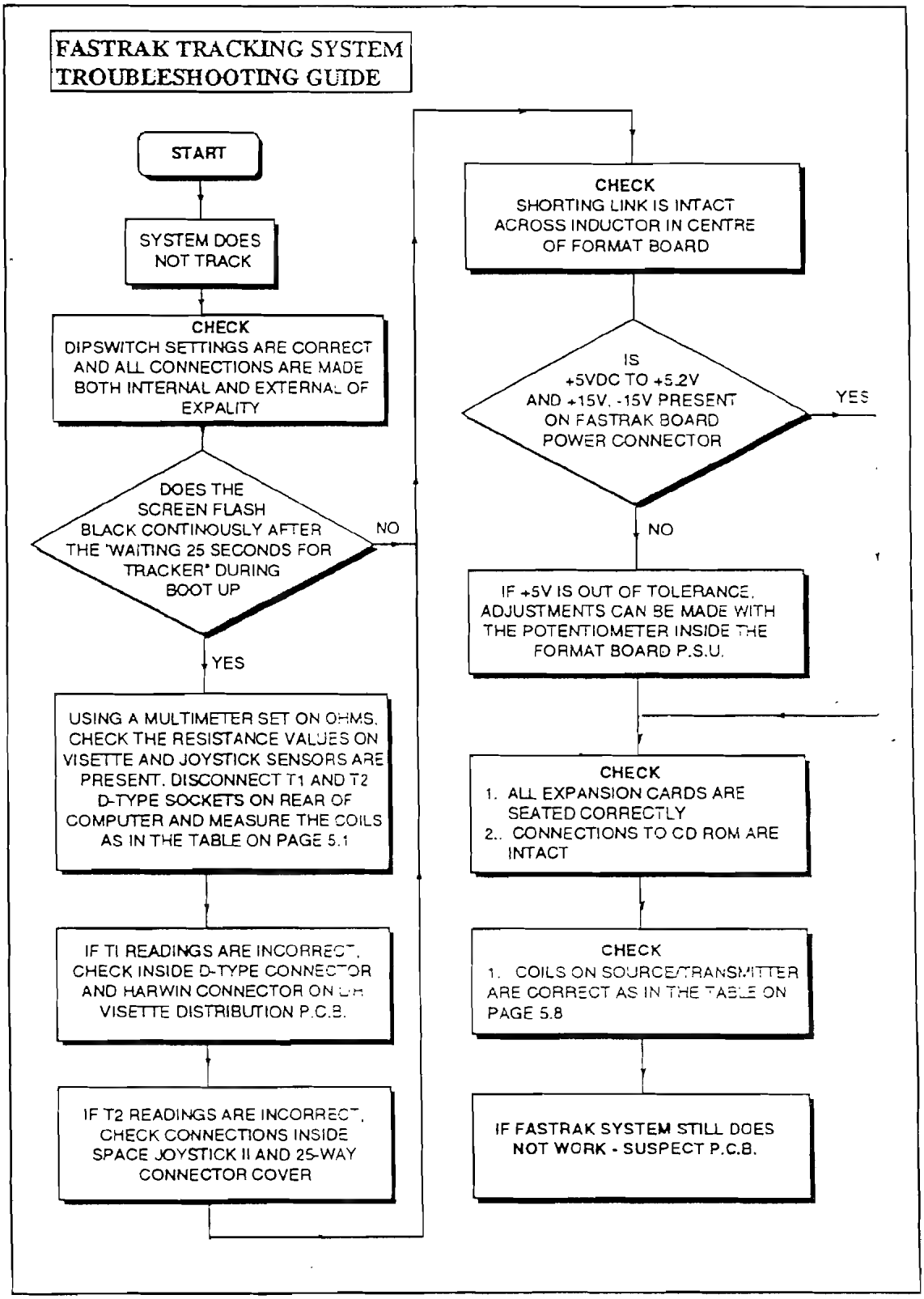


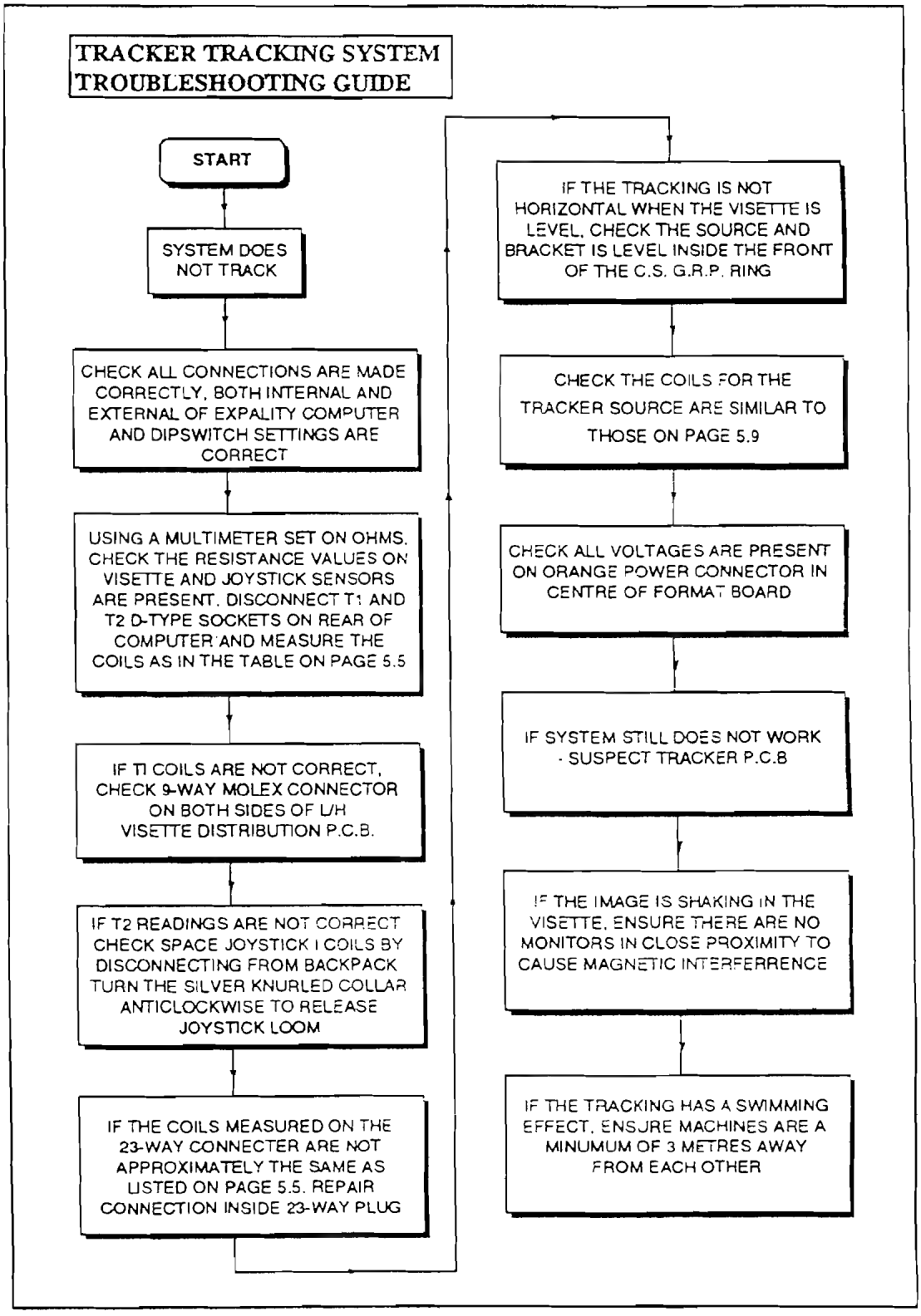
PIN No.	COLOUR	SIGNAL
12	Orange	Coil
6	Green	Coil
11	Screen	Screen
4	Grey	PROM GND
3	Purple	PROM Data
5	Blue	Z Coil
10	Yellow	Z Coil
2	Red	Y Coil
9	Brown	Y Coil
1	Black	X Coil
7	White	X Coil
8	Screen	Coils Screen

Fastrak Board



Reproduced for guidance only with permission from Polhemus Inc. USA


FASTRAK TRACKING SYSTEM
TROUBLESHOOTING GUIDE
START
SYSTEM DOES NOT TRACK
CHECK
DIPSWITCH SETTINGS ARE CORRECT AND ALL CONNECTIONS ARE MADE BOTH INTERNAL AND EXTERNAL OF EXPALITY
DOES THE SCREEN FLASH BLACK CONTINOUSLY AFTER THE 'WAITING 25 SECONDS FOR TRACKER' DURING BOOT UP
NO
YES
USING A MULTIMETER SET ON OHMS. CHECK THE RESISTANCE VALUES ON VISETTE AND JOYSTICK SENSORS ARE PRESENT. DISCONNECT T1 AND T2 D-TYPE SOCKETS ON REAR OF COMPUTER AND MEASURE THE COILS AS IN THE TABLE ON PAGE 5.1
IF T1 READINGS ARE INCORRECT, CHECK INSIDE D-TYPE CONNECTOR AND HARWIN CONNECTOR ON THE VISETTE DISTRIBUTION P.C.B.
IF T2 READINGS ARE INCORRECT, CHECK CONNECTIONS INSIDE SPACE JOYSTICK II AND 25-WAY CONNECTOR COVER
CHECK
SHORTING LINK IS INTACT ACROSS INDUCTOR IN CENTRE OF FORMAT BOARD
IS +5VDC TO +5.2V AND +15V, -15V PRESENT ON FASTRAK BOARD POWER CONNECTOR
YES
NO
IF +5V IS OUT OF TOLERANCE, ADJUSTMENTS CAN BE MADE WITH THE POTENTIOMETER INSIDE THE FORMAT BOARD P.S.U.
CHECK
1. ALL EXPANSION CARDS ARE SEATED CORRECTLY
2.. CONNECTIONS TO CD ROM ARE INTACT
CHECK
1. COILS ON SOURCE/TRANSMITTER ARE CORRECT AS IN THE TABLE ON PAGE 5.8
IF FASTRAK SYSTEM STILL DOES NOT WORK - SUSPECT P.C.B.


TRACKER TRACKING SYSTEM
TROUBLESHOOTING GUIDE
START
SYSTEM DOES NOT TRACK
CHECK ALL CONNECTIONS ARE MADE CORRECTLY, BOTH INTERNAL AND EXTERNAL OF EXPALITY COMPUTER AND DIPSWITCH SETTINGS ARE CORRECT
USING A MULTIMETER SET ON OHMS, CHECK THE RESISTANCE VALUES ON VISETTE AND JOYSTICK SENSORS ARE PRESENT. DISCONNECT T1 AND T2 D-TYPE SOCKETS ON REAR OF COMPUTER AND MEASURE THE COILS AS IN THE TABLE ON PAGE 5.5
IF T1 COILS ARE NOT CORRECT, CHECK 9-WAY MOLEX CONNECTOR ON BOTH SIDES OF L/H VISETTE DISTRIBUTION P.C.B.
IF T2 READINGS ARE NOT CORRECT CHECK SPACE JOYSTICK I COILS BY DISCONNECTING FROM BACKPACK TURN THE SILVER KNURLED COLLAR ANTICLOCKWISE TO RELEASE JOYSTICK LOOM
IF THE COILS MEASURED ON THE 23-WAY CONNECTER ARE NOT APPROXIMATELY THE SAME AS LISTED ON PAGE 5.5. REPAIR CONNECTION INSIDE 23-WAY PLUG
IF THE TRACKING IS NOT HORIZONTAL WHEN THE VISETTE IS LEVEL, CHECK THE SOURCE AND BRACKET IS LEVEL INSIDE THE FRONT OF THE C.S. G.R.P. RING
CHECK THE COILS FOR THE TRACKER SOURCE ARE SIMILAR TO THOSE ON PAGE 5.9
CHECK ALL VOLTAGES ARE PRESENT ON ORANGE POWER CONNECTOR IN CENTRE OF FORMAT BOARD
IF SYSTEM STILL DOES NOT WORK - SUSPECT TRACKER P.C.B
IF THE IMAGE IS SHAKING IN THE VISETTE, ENSURE THERE ARE NO MONITORS IN CLOSE PROXIMITY TO CAUSE MAGNETIC INTERFERRENCE
IF THE TRACKING HAS A SWIMMING EFFECT, ENSURE MACHINES ARE A MINUMUM OF 3 METRES AWAY FROM EACH OTHER

Intentionally left blank for future use.

PAGE

8.1 ETS Handbook Cover
8.2 Description
8.5 Menu
8.6 Joystick and Steering Wheel
8.7 CD ROM and Format Board Amplifier
8.8 Lamp Operation and Tracker Diagnostics
8.9 Visette® Alignment and Credit Check
8.10 Expansion Board List and Glove Operation

E.T.S.

– ENGINEERING TEST SYSTEM

HANDBOOK

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ETS - ENGINEERING TEST SYSTEM

Description

ETS is installed on your Expality computer to allow diagnostic testing of the Virtuality system to be carried out on site. This is a brief description of the facilities available with ETS.

To run ETS, simply type 'Q' to stop the Experience, the text mode should now appear on the monitor, then type the command ETS followed by the <enter> key. You will see a screen displayed as shown in Figure 1. You now have the option of investigating any of the nine items listed. Select the item you want simply by pressing the relevant function key located along the top row of the keyboard.

Typing the escape key at the top left of the keyboard, <Esc>, will exit from the ETS programme.

F1 - Tune Joysticks/ Steering Wheelunit.

NOTE:- Used only for the 1000SD

Pressing the 'F1' key will display the screen shown in Figure 2. This facility will allow you to check the tuning of the joysticks and/or the steering wheel, depending on which type of 1000SD unit you have. If your 1000SD has joysticks, press 'F1'. If your 1000SD has a steering wheel, press 'F2'.

F1 - Tune Joysticks

Having pressed 'F1' you will see an image similar to that shown in Figure 3. To determine if the joysticks are tuned correctly, the small red circles should be as near as possible to the centres of their surrounding squares. If they are not, you can adjust the positions by means of the 2 adjusting potentiometers on the format board inside the Expality computer. To assist this, the current X and Y values of the joysticks are displayed above each square. These values reflect the positions of the joysticks and should be set to +100 for maximum deflection, -100 for minimum deflection and 0 for the joystick rest position.

Also displayed on the joystick switch conditions. Pressing a switch will display 'ON', releasing it will display 'OFF'.

Typing <Esc> will bring you back to the main menu.

F2 - Tune Steering Wheel

Having pressed 'F2', you will see an image similar to that shown in Figure 4. To determine if the steering wheel is tuned correctly, the small red circle should be as near as possible to the top centre of their large circle. If it is not, you can adjust the position by means of the adjusting potentiometer on the format board inside the Expality computer. To assist this, the current value of the steering wheel is displayed above the circle. This value reflects the position of the steering wheel and should be set to +100 for maximum deflection, -100 for minimum deflection, and 0 for the resting position.

Also displayed are the 1000SD unit switch conditions. Pressing a switch will display 'ON', releasing it will display 'OFF'

F2 - CD Rom Test

Typing <Esc> will bring you back to the main menu.

Pressing the 'F2' key will display a screen similar to that shown in Figure 5. This facility will allow you to check the running of the CD ROM unit.

The screen should be self-explanatory, enabling you to start and stop the CD unit, selecting specific tracks, and control the volume.

Typing <Esc> will bring you back to the main menu.

F3 - Format Board Amplifier

Pressing the 'F3' key will display a screen similar to that shown in Figure 6. This facility will allow you to check the volumes of the audio components of the Virtuality system.

The screen should be self-explanatory, enabling you to control the volumes of the CD the sound effects and the Visette microphone. The current levels are displayed as a logarithmic scale in the range 0 to 63.

Typing <Esc> will bring you back to the main menu.

F4 - Front Panel Lights

Pressing the 'F4' key will display a screen similar to that shown in Figure 7. This facility allows you to check the operation of the lamps on the Virtuality units (2 lamps on the 1000CS, 3 lamps on the 1000SD)

The screen should be self-explanatory, enabling you to switch the lamps on and off, or flash them.

Typing <Esc> will bring you back to the main menu.

F5 - Tracker Diagnostics

Pressing the 'F5' key will display a screen similar to that shown in Figure 8. This facility will allow you to check the operation of the tracker system.

The screen should be self-explanatory with the tracker giving information about the position and orientation of both the Visette and another tool (if fitted).

Typing <Esc> will bring you back to the main menu.

F6 - Visette Stereo Alignment

Pressing the 'F6' key will display a screen similar to that shown in Figure 9. This facility will allow you to check the stereo imagery in the Visette by displaying a succession of test cards. These test cards are selectable by means of the 'F1' and 'F3' keys. The stereo overlap of the image can also be software controlled, by means of typing 'F2' to alter the overlap. At the present time, the overlap must be set to 100 percent.

Typing <Esc> will bring you back to the main menu.

ETS - ENGINEERING TEST SYSTEM

F7 - Credit Device

Pressing the 'F7' key will display a screen similar to that shown in Figure 10. This facility will allow you to check the operation of the credit device (if fitted).

The screen should be self-explanatory, with the display indicating the total amount of credits already inserted. Typing 'F1' will reduce this value by one, each time it is pressed.

Typing <Esc> will bring you back to the main menu.

F8 - List Expansion Boards

Pressing the 'F8' key will display a screen similar to that shown in Figure 11. This facility will list all of the expansion boards present in your Expality computer.

The screen should be self-explanatory, displaying the board type, its address in the Expality memory, and the amount of Expality memory utilised.

Typing <Esc> will bring you back to the main menu.

F9 - Show Glove Fingers

Pressing the 'F9' key will display a screen similar to that in Figure 12. This facility will allow you to check the operation of each finger sensor on the Spaceglove.

Typing <Esc> will bring you back to the main menu.

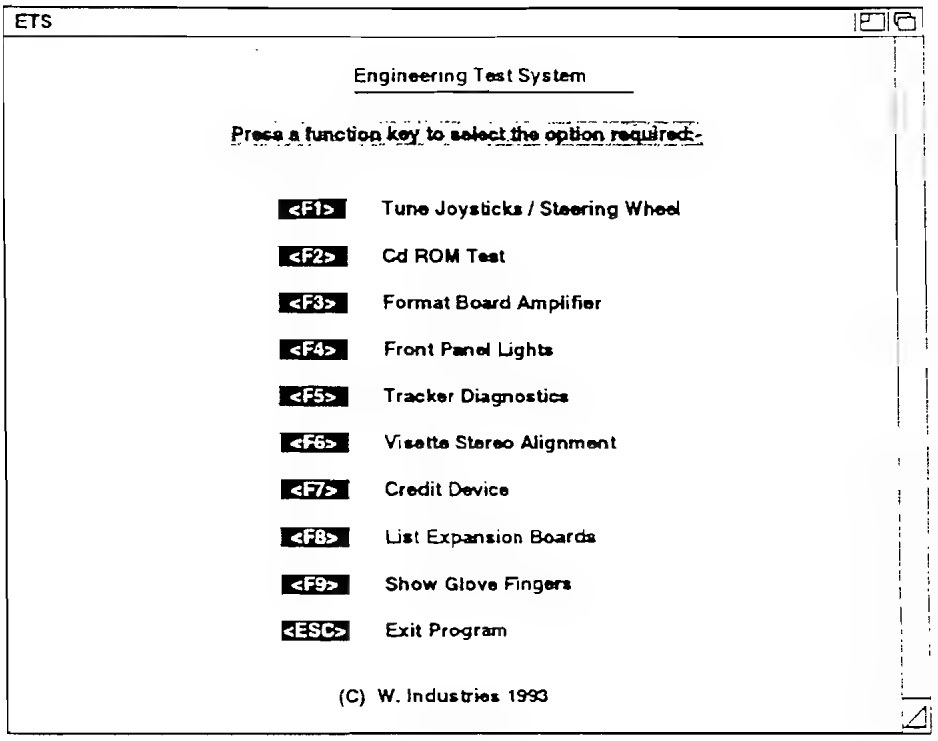

Figure 1

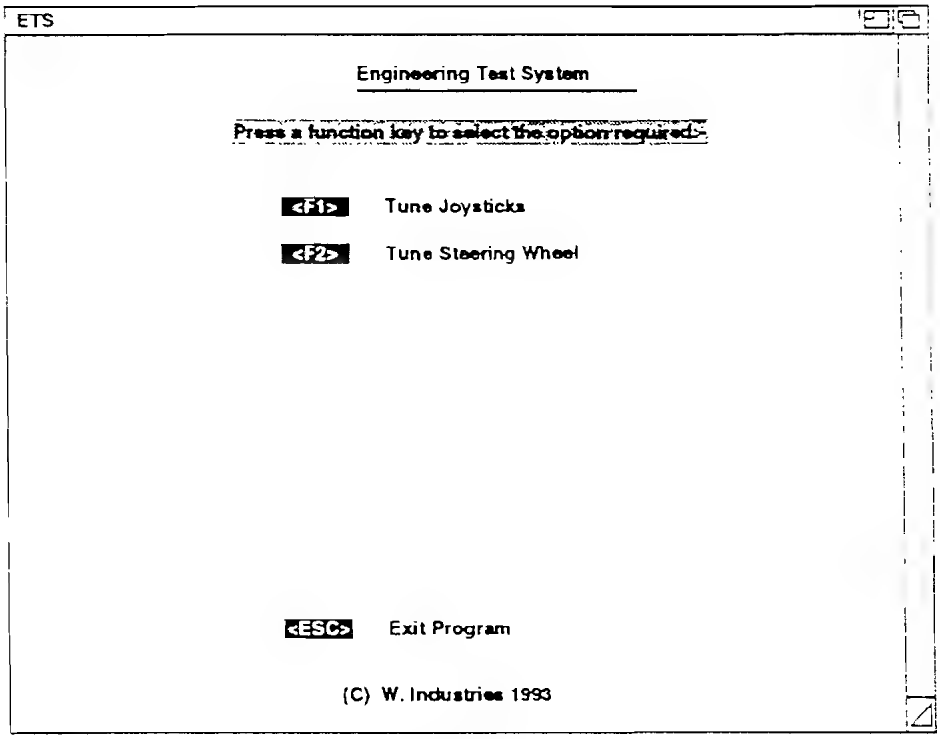

Figure 2

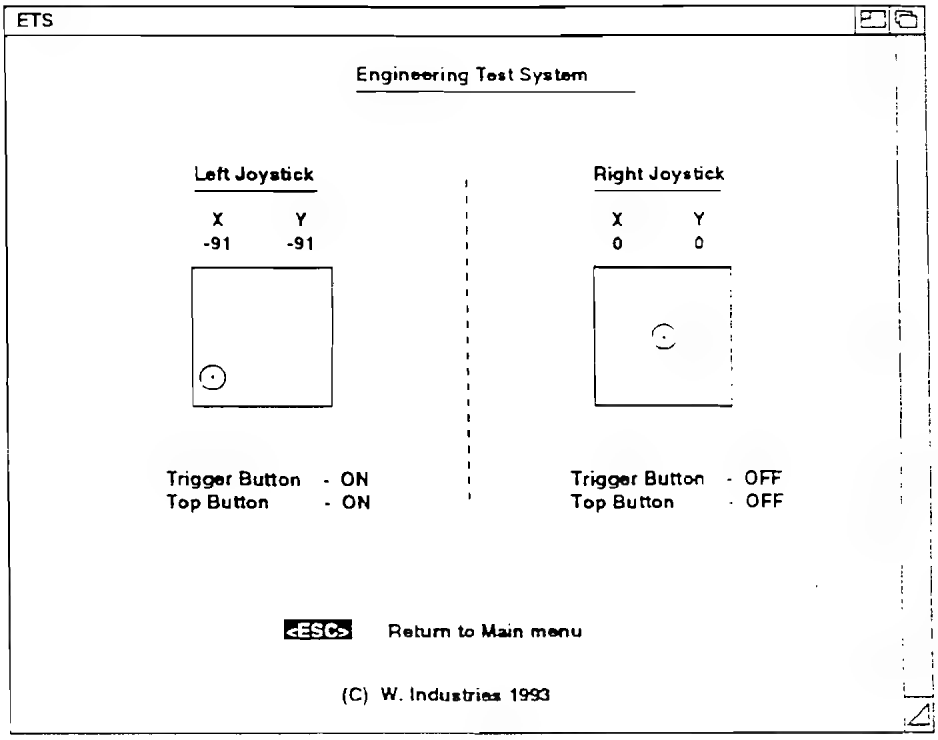

Figure 3

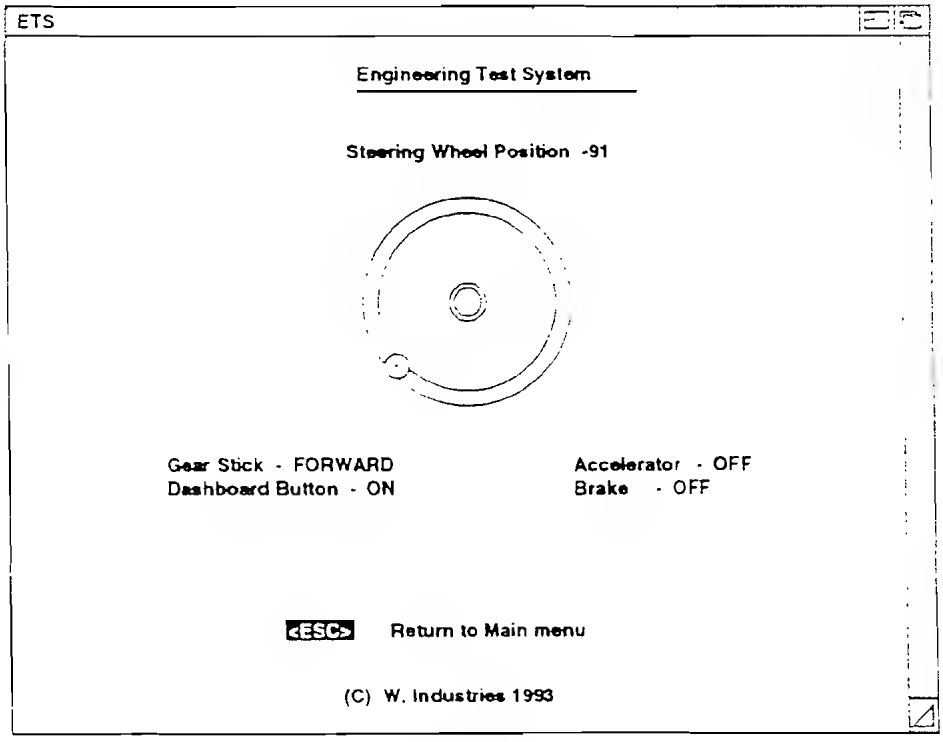

Figure 4

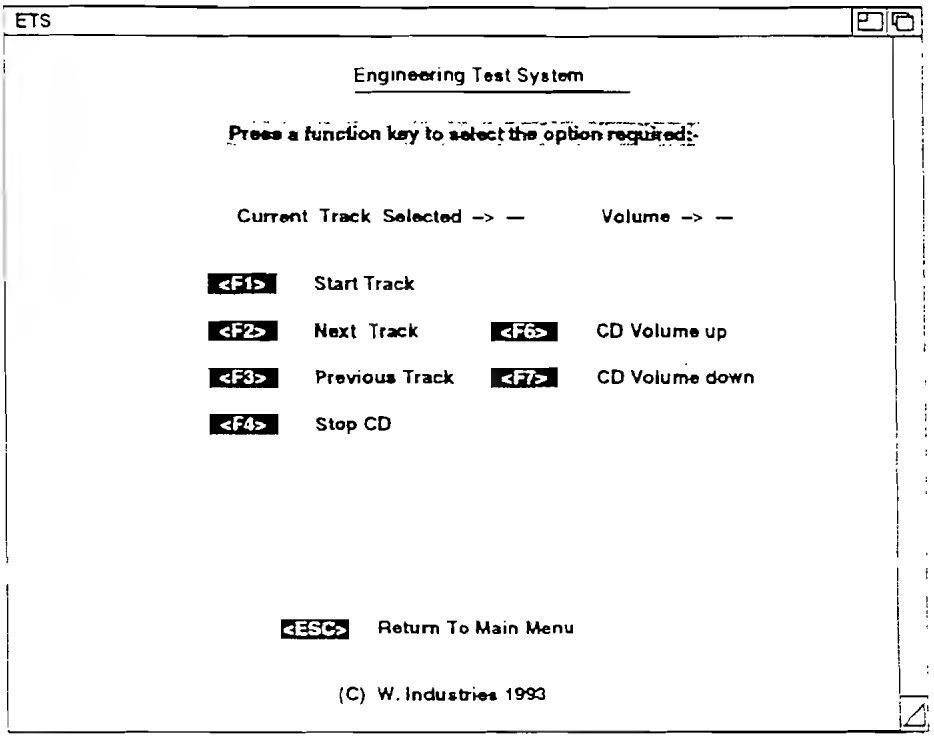

Figure 5

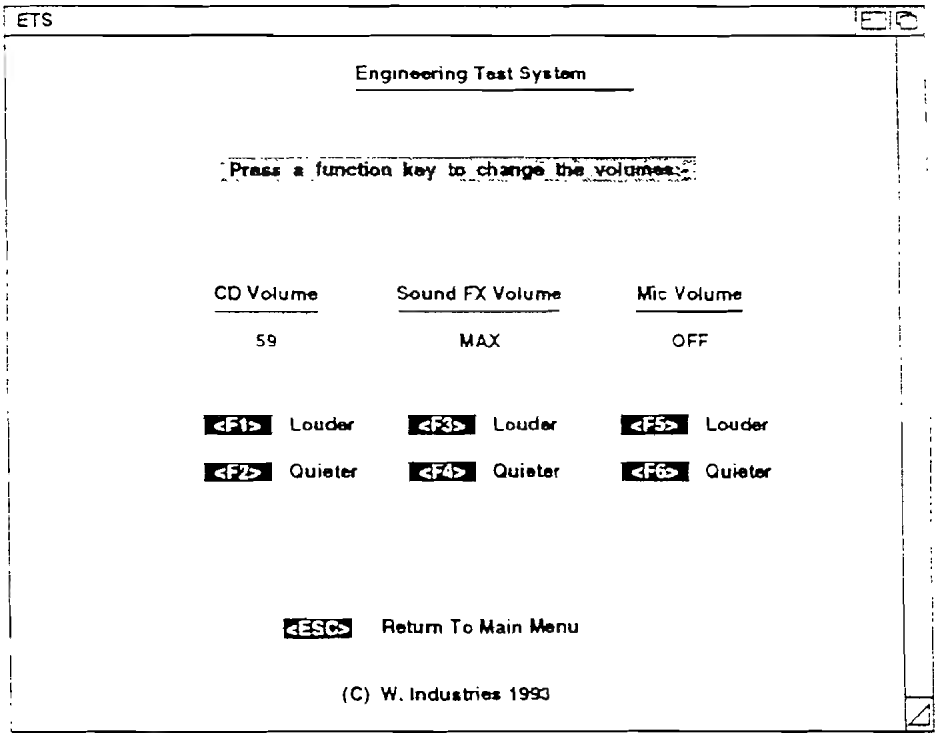

Figure 6

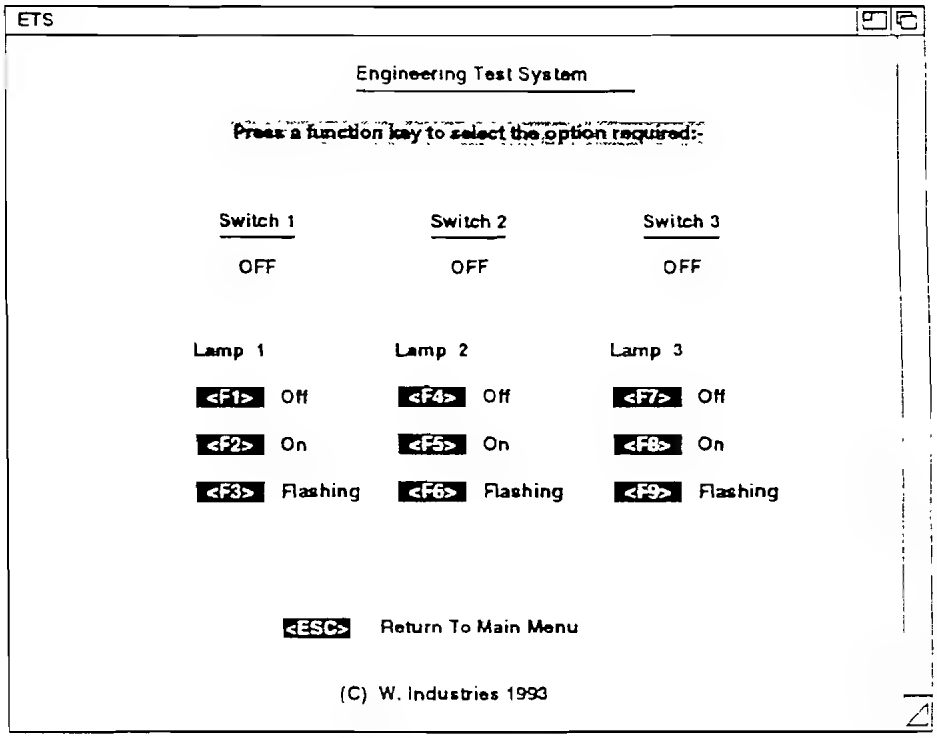

Figure 7

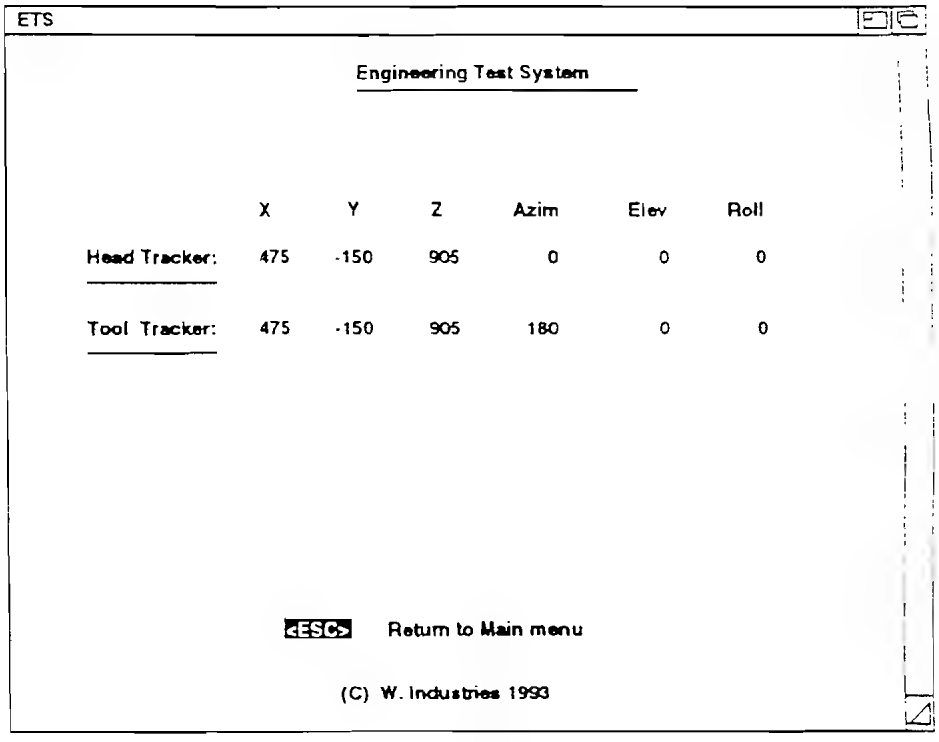

Figure 8

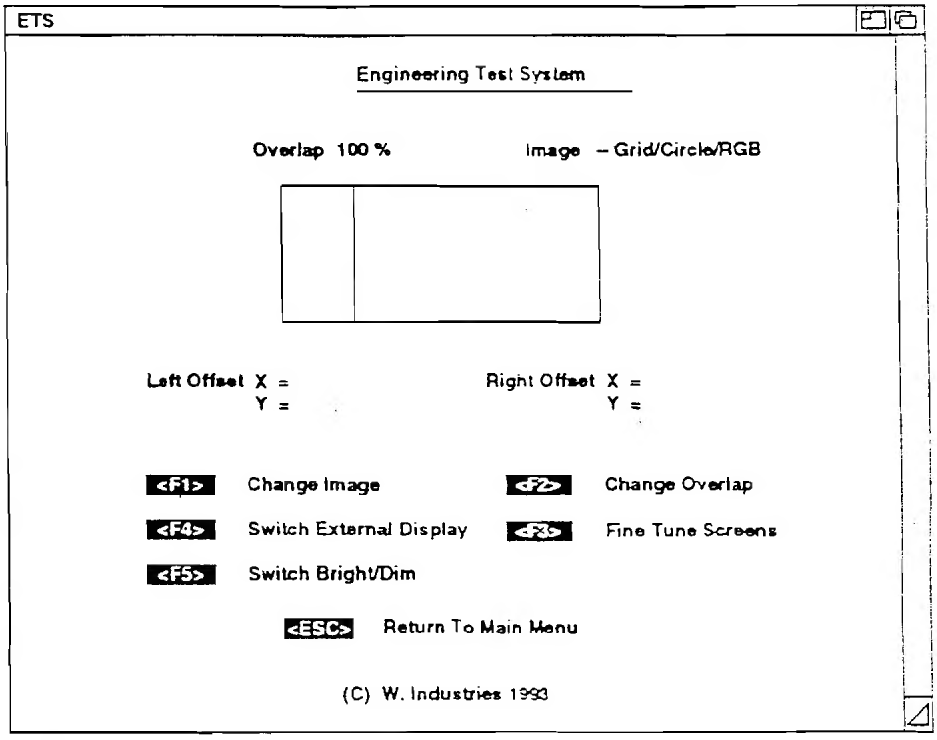

Figure 9

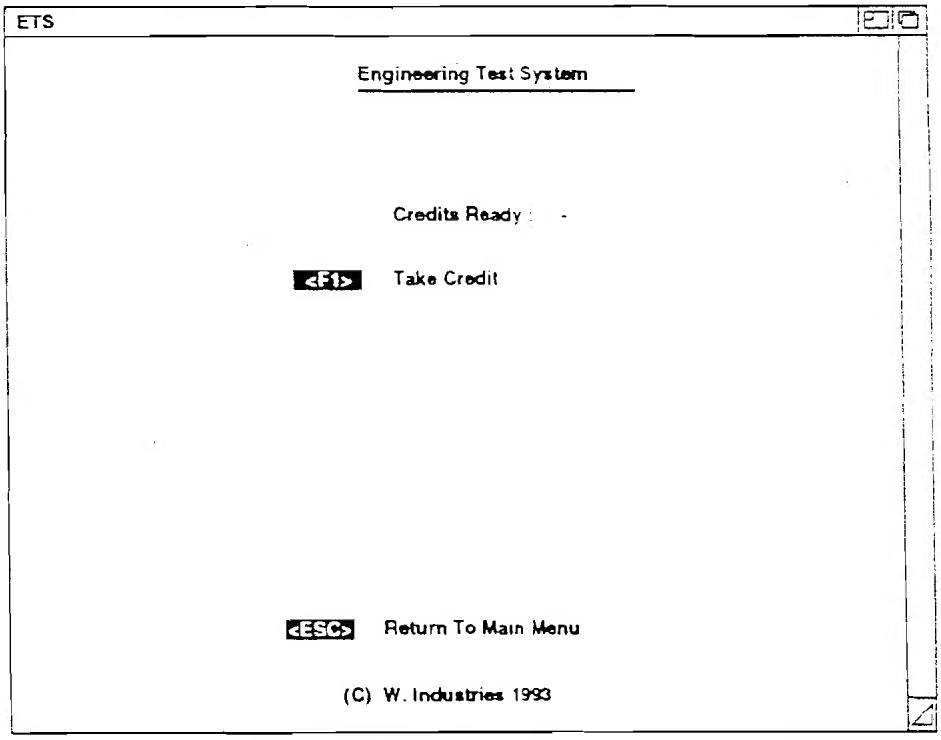

Figure 10

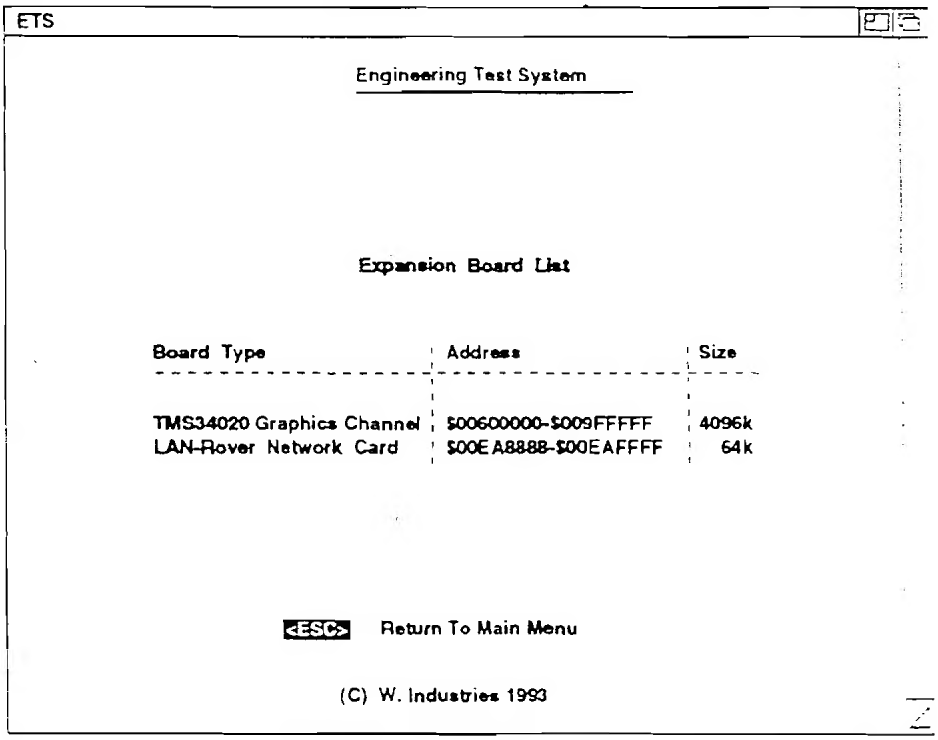

Figure 11

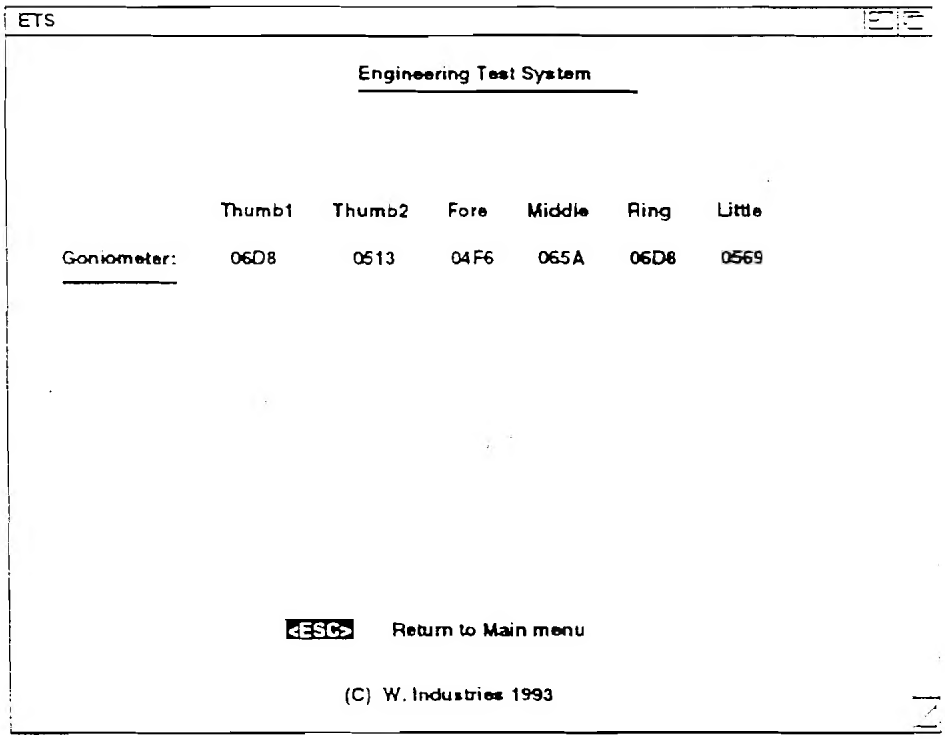

Figure 12

SECTION 9
HELP DETAILS

PAGE

9.1 Help Details

HELP DETAILS

We hope this manual has been of great assistance in solving any problem you may have with your CS 1000 Virtuality unit. If however you still have any queries, please do not hesitate to call your local Virtuality Distributor or contact :

VIRTUALITY ENTERTAINMENT LTD U.K.
CUSTOMER SERVICE DEPARTMENT

TEL : 44 (0) 533 548571
FAX : 44 (0) 533 548573

VIRTUALITY ENTERTAINMENT INC U.S.A.

TEL : 01 (1) 314 331 6178
FAX : 01 (1) 314 331 6413